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ENERGY

No. 137

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GENERAL

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GOSPLAN CHAIRMAN SUMMARIZES PLANS FOR OIL-RECOVERY INDUSTRY

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 3-6

[Article by N. K. Baybakov, deputy chairman of the USSR Council of Ministers and Chairman of USSR Gosplan: "Years of Great Accomplishments"]

[Excerpts] The historic path that our country's oil industry has traveled is serving as a bright reflection of the effectiveness of the socialist order that has been established in the Union of Soviet Socialist Republics.

At the modern stage of the national economy's development, the problem of supplying the country with oil and petroleum product will become broader than simply that of increasing the recovery of oil. It means also an intensifying of oil refining and gas-condensate extraction, the use of liquefied and compressed gas in automotive transport, the production of synthetic liquid fuel made from coal, and a rise in the utilization effectiveness of petroleum product, as well as the development of other sources for replacing petroleum.

The 26th CPSU Congress assigned an important place in long-range plans to the oil and gas industry as one of the leading branches of the fuel and power complex. The recovery of gas and oil in West Siberia and the transport thereof to the country's European part was defined as a most important element of the energy program.

In order to provide for the oil industry's systematic development, much attention will be paid to preparing industrial reserves of oil in parts of East Siberia and the Far East, the North of West Siberia, the Caspian depression and the offshore shelves.

At the same time, as L. I. Brezhnev emphasized in his report to the 26th CPSU Congress, the successes of the whole national economy will depend greatly upon a rise in the effectiveness of the recovery industry. This should be the basis for plans for technical development and for the branch's whole economics and management activity.

There are many reserves for raising the oil-recovery industry's effectiveness. One of the most important in the long term is the task of developing and introducing new methods for increasing oil withdrawal from the formations. Many years of experience have indicated that waterflooding of the productive formations completely justifies itself as a means for increasing oil withdrawal, but, along with improving it further, the development and introduction into industrial practice of new methods that are founded upon physico-chemical and thermal stimulation of the

formation and will greatly raise withdrawal must be speeded up. There is industrial experience in such methods. They are being implemented in 20 associations and they cover 53 fields, at which only individual sections are still being singled out for testing. In all, there are more than 100 industrial-test sections, at some of which positive results have already been achieved. However, the testing work is being promoted slowly, and there are constant delays with preparation of the equipment and chemical reactants, as well as construction of the facilities. Test results indicated that problems arose during the tests that required deeper study of the mechanisms of formation processes. Consequently, along with a speedup in the pace of industrial-test operations, theoretical studies also must be expanded and improved.

Nor can one overlook the fact that some specialists display an unjustified skepticism, considering the new methods for increasing withdrawal as too expensive and not effective enough for growth in crude recovery. It is necessary, naturally, to approach an assessment of the desirability of using any method not from the standpoint of the current period but from that of looking far ahead and of preparing today the operating base for the future, since use of the fields' remaining reserves will always be of great national economic importance.

The oil industry is increasingly becoming an area that is favorable for the wide application of chemicals to operating processes with a view to intensifying them.

Modern chemical science is opening up many new possibilities for oilfield workers. The promise of the application of chemicals in the branch is great. Minnefteprom [Ministry of Petroleum Industry] has prepared a broad special-purpose integrated program for using effective chemical methods in operating processes that will embrace the recovery and treatment of crude, the drilling of wells, oil-pipeline transport and many other areas. Fulfillment of the planned program should be the subject of the most serious concern of both oilfield workers and the workers of interdependent ministries and agencies.

An important way to raise oil recovery is to increase the utilization effectiveness of the oil-well inventory. The number of producing oil wells, after years of accelerated development of the branch, has reached almost 90,000, about 15,000 of them in West Siberia, and a large inventory is located in Azerbaijan and Tataria.

In speaking about reserves for raising the well inventory's utilization effectiveness, one should keep in mind three important directions in this work: drawing the whole existing inventory into operation to the maximum, providing for the optimal recovery of crude from each well, and increasing substantially the time between repairs on underground and surface equipment.

Oil-recovery enterprise collectives are doing systematic work that is yielding definite results in these areas. Thus, during 1981 the number of inactive wells was reduced by 10 percent or more, while in the Yuganskneftegaz, Bashneft', Tatneft', Ukrneft', Krasnodarneftegaz and a number of other associations the share of such wells has fallen below the branch average. At the same time, there are many wells that are inactive after operation in Azerbaijan, Kazakhstan, Turkmenia and some parts of the RSFSR.

Sometimes the existence of inactive wells is explained by their being taken out of operation because of excessive water encroachment of the formation, yet many associations are finding effective ways to restrict water influx and increase the

proportion of crude oil in the wells' output. Such experience exists in Bashkiria, Tataria, West Siberia and other regions, and it needs only to be used more widely.

At the same time, effective measures are needed for improving the operating time of the existing well inventory, because, on an average for the branch as a whole, well idle time is 1.6 percent because of repair and 2.7 percent for other causes. It would seem that even a small reduction in the downtime of producing wells will yield a considerable augmentation to oil recovery per year. In some areas there has been less concern about an optimal regime for well operation, although the experience of many associations has indicated that modern methods of optimization, using computers, are completely justifying themselves and are serving as one of the reliable means for improving the use of their recovery potential.

Providing for precise organization and high quality of well repair is an exceptionally important task. It must be noted that well-repair indicators during the 10th Five-Year Plan improved considerably. Despite a significant growth in the number of wells, the current-repair volume was reduced during a five-year period, from 229,700 in 1975 to 228,600 in 1980, by increasing operating time between repairs and by raising the output per repair brigade and the shift-utilization factor. Thus, an important trend toward reduced frequency of current repair of wells has been traced accurately. During the 11th Five-Year Plan it is planned to reduce the average repair frequency per well from 2.69 to 2.30. An even greater reduction can be achieved. But for this purpose, certain associations must sharply improve the organization of repair in accordance with the advanced experience that exists in the industry, and the reliability of the equipment arriving at the fields for operating wells must be sharply improved.

The machinebuilders should help oilfield workers to change the structure of operating methods in favor of those that afford the longest time between repairs, flexibility in the regulation of yield, and greater adaptability to the complicated circumstances of well operation. These requirements are met by modern gaslift, as well as by hydraulic-piston pump units, which have been tested in West Siberia.

The wide dissemination of periodic operation of stripper wells, which conforms with the task of reducing the electric power consumed in raising crude from the wells and of cutting wear on the equipment, pump rods and pipe, has great promise.

An important reserve for raising the oil industry's effectiveness is the elimination in every possible way of the loss of casing-head gas at oilfield facilities. For a long time large amounts of it were flared off, especially in new oilfield regions, as a result of a lag in the construction of gas-treatment plants and gas pipelines behind the pace of oil recovery and the increase in gas resources. Meanwhile, casing-head gas is just as important as crude as a raw material for the petrochemical industry, and the fulfillment of plans for utilizing it should have the same priority as the fulfillment of plans for recovering crude.

The prospects for further developing oil recovery is linked with drilling work, the volume of which grows considerably each year. Thus, during 1976-1980 the level of annual penetration in meters, as well as the number of well completions, grew considerably, the annual output per drilling brigade increased by 45.4 percent, and the task for increase in new capacity for oil recovery, especially in West Siberia and the Komi ASSR, was met. During the 10th Five-Year Plan penetration speed rose by 13 percent during operational drilling, 20 percent during exploratory drilling. Average time for well construction decreased 34.7 percent.

This improvement in drilling indicators is the result of an intensification of attention to the reserves of drilling organizations and to a rise in their production efficiency. However, upon deeper analysis, it is not difficult to see that reserves here are still being used far from completely. In the Volga-Ural region, for example, well-construction time has been reduced only through the time saved in erecting the drill rigs and in testing the wells after drilling, while the time spent on the basic construction stage (drilling of the well proper) remained at the 1975 level.

At the same time, there are important reserves for increasing efficiency also at this stage of well construction. Much organizational idle time is observed in drilling brigades that is associated with imprecise work by both the drilling enterprises themselves and the various auxiliary services. In 1981 alone organizational downtime was equivalent to the inactivity of 50 drilling brigades. The brigade utilization factor during drilling and well testing did not exceed 320 days, while drill rigs were utilized about 60 percent. All this is the result of a lack of improvement in management and in the organization of drilling work.

The drillers have set themselves a task that is very important from the national economy's point of view—that of providing for the execution of a growing volume of drilling during the 11th Five-Year Plan without increasing the number of brigades. This task is completely realistic, and there is confidence that the drillers, by mobilizing their rich advanced production experience, will cope with it honorably.

Oilfield labor collectives should, in their daily activity, observe the strictest savings regime, use material resources rationally and have a thrifty attitude toward the equipment. In 1981 serious derelictions in accounting for and in storing and using equipment and materials were discovered at certain enterprises. These violations have now been eliminated, but sometimes annoying cases of wastefulness and extravagance are still encountered. Losses of crude in the preparation and transport systems still exist, unjustifiably large amounts of it are being consumed for the enterprises' in-house needs, and losses of crude that result from accidents, which inflict no small harm on the environment, have not been eliminated. The struggle with losses of crude in all operating elements of the oil industry should be a daily task for all the industry's enterprises.

The state is allocating substantial capital investment and material and labor resources to oil-industry development. The task of increasing the economic efficiency of capital investment, making rational use of fixed capital, saving material expenditures and increasing labor productivity should be the center of attention of all oil-industry workers. Closely linked with this task is the serious problem of the rational use of labor resources. As a result of the execution of measures to automate production and to improve work organization in the industry, specific worker manpower for tending the wells has been greatly reduced. Nevertheless, based upon analysis of the branch's state of affairs, the 26th CPSU Congress has set for oilfield workers during the 11th Five-Year Plan an extremely important task—that of reducing labor expenditures for tending wells by 15-18 percent per well. Advanced oil-recovery brigades have achieved great successes in this work, and judicious, deeply thought-out distribution of forces for production, taking account of the peculiarities of each oilfield and oilfield section, has helped them. However, for the industry as a whole, persistent work is still necessary, to reduce labor expenditures for servicing.

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GENERAL

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NEEDED IMPROVEMENTS IN OIL INDUSTRY DISCUSSED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 7-12

[Article by N. A. Mal'tsev, minister of oil industry: "The Oil Industry's Reserves and Prospects"]

[Excerpts] Strenuous work is to be done to speed up oil-industry development in West Kazakhstan and to master Komi ASSR oilfields. The Zhanazhol, Karachogan, Tengiz and other hydrocarbon fields discovered within the Caspian depression in recent years are moving West Kazakhstan up to second place after West Siberia. They are the new raw-materials base for creating a power-engineering and chemical complex.

One of the main directions for developing power engineering is improvement of the fuel-balance structure. In particular, it is planned to remove high-quality types of organic fuel, primarily oil and petroleum product, from the boiler-and-furnace fuel category by making wider use of coal mined by the strip-mining method, nuclear power, natural gas, hydroelectric energy and nontraditional energy sources.

The oil industry is extremely capital intensive and materials intensive. Attributing enormous importance to its development, the party and the government are earmarking enormous material and financial resources for creating new oil-recovery capacity. This is connected to a great extent with the location of the main oil recovery activity in remote regions that are difficult of access and with a sharp increase in expenditures to compensate for oil-recovery capacity in older oil-bearing regions. Under these circumstances, enormous work must be done to seek out ways for making effective use of capital investment and overcoming the trends toward a reduction in return on capital.

These are the basic specific prerequisites for developing the oil industry in the modern era. More than 1,000 oil deposits with a broad diversity of physico-geological, physico-chemical and thermodynamic conditions are now being developed. Moreover, they are located in different natural and climatic zones.

These days a sharp worsening of the geological operating conditions of fields and deposits newly introduced into development is characteristic of the modern era. Simultaneously, many highly productive fields in the oil regions that have been developed are already in the stage of declining oil recovery. Thus, essential changes have occurred in the structure of the oil industry's raw-materials base. Instead of highly permeable homogeneous terrigenous oil-containing formations, oil-field workers are having to work more with poorly permeable, lithologically

variable carbonate reservoirs. This affects the level of daily recovery from the oil wells newly put into operation, which in recent years has been sharply reduced.

Moreover, the new fields of West Kazakhstan are characterized by a high content of hydrogen sulfide and carbonic acid (up to 25 percent), the presence in the log of thick salt-bearing sediments (up to 1,500 meters) that are subject to plastic flow, and anomalously high formation pressures (up to 90 MPa).

The distribution of the main amounts of oil recovery in the region of West Siberia itself and in the North of the European part of the USSR and development of the new West Kazakhstan fields are accompanied by a substantial increase in the complexity of geological conditions for drilling. The severe climate and the great remoteness and difficulty of access of the new regions are aggravated by the wide distribution in the country's north of rock that has been frozen for many years. Such a situation is expected also in the long term because of further entry into new regions of the country's east and north.

Taking into account the circumstances enumerated, the traditionally prevailing trends in the creation and improvement of equipment, tools and materials for recovering oil and gas and for drilling wells are to change greatly. Also, a completely new approach to the technology of developing fields, recovering oil and gas, and drilling will be required. Questions of protecting the environment will acquire special importance in this case.

The branch faces a major set of problems that should be resolved in the very near future. For these purposes, it is planned to take important steps that call for major joint work by oilfield workers and the workers of interdependent branches. The industry's entire economic mechanism should be oriented to solution of the problems posed, and all available administrative, economic and motivational levers should be used.

One of the main problems of developing the oil branch during this five-year plan and in the long term is a further speedup in drilling volume. In comparison with the 10th Five-Year Plan, the drilling of development wells during the 11th Five-Year Plan should double because of the introduction into development of oil deposits that are, basically, less productive. While in 1970, 265,000 meters of penetration were required per 1 million tons of growth in the recovery of oil and gas condensate (taking into account compensation for a drop in recovery), in 1980 the figure was 866,000 meters, and 7 million meters will be required in 1985.

The 26th CPSU Congress decisions defined the basic direction for solving these important tasks: the buildup in penetration volume should be accomplished mainly by intensifying operations and by radical improvement of the technical and economic indicators for drilling, based upon speeded-up reequipping and further improvement in technology and in the organization of drilling.

In order to create a reliable base for further developing drilling work, a detailed program--a very important document for the industry--has been adopted, which not only defines the direction of technical progress but also establishes tasks for interdependent industries that build capacity for producing progressive drilling equipment and materials. It calls for the creation and mastery of the production of drill rigs of a whole parametric series, particularly of special rigs for work in the Far North environment. Much work is to be done to further improve rock-breaking tools and create capacity for producing pipe of modern design for drilling and casing, and pumps and compressors.

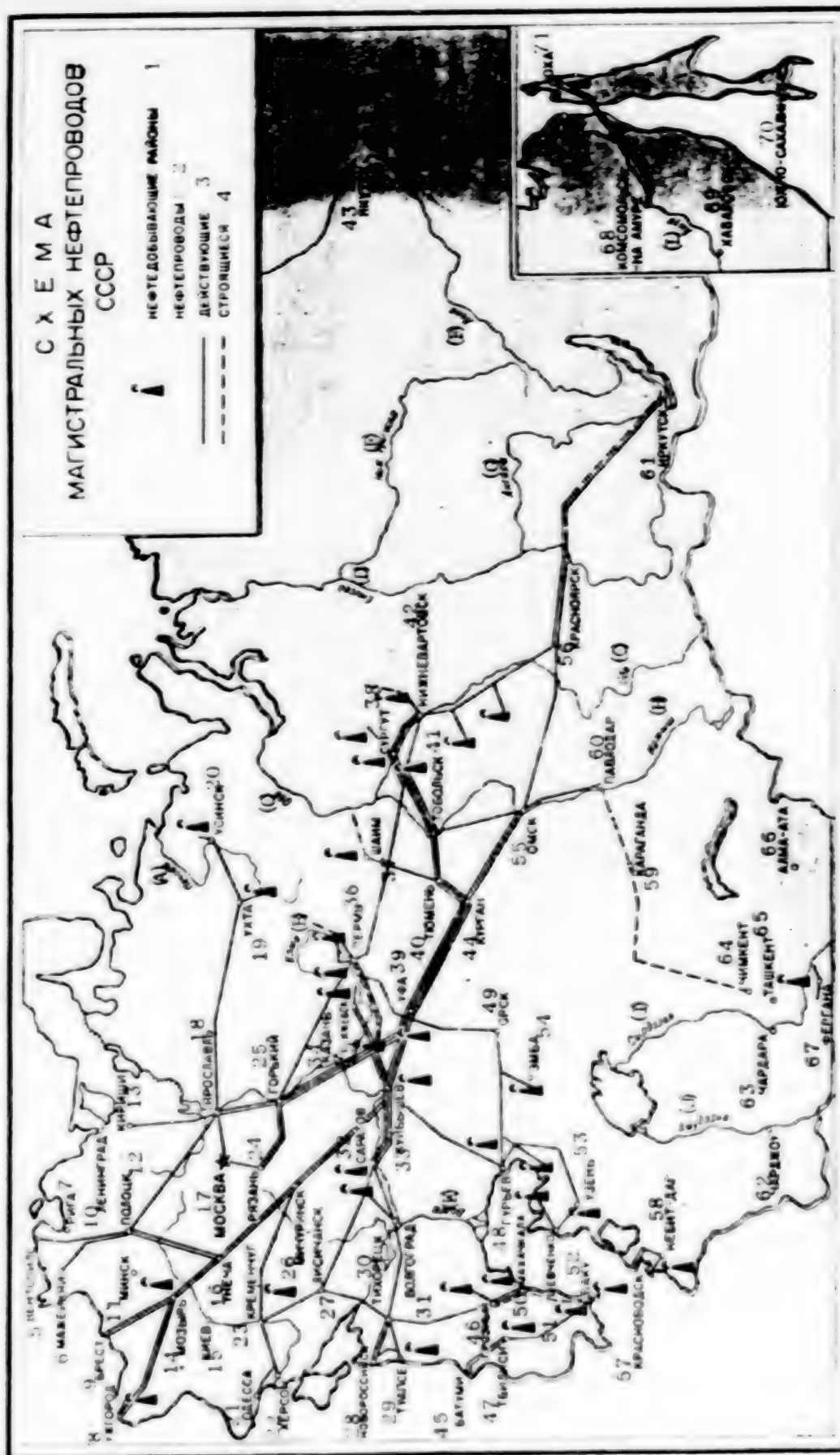


Diagram of the USSR's Trunk Oil Pipelines

Key:

1. Oil-recovery regions.
2. Pipelines.
3. Existing.
4. Under construction.

5. Ventspils.
6. Mazheykyay.
7. Riga.
8. Uzhgorod.
9. Brest.
10. Leningrad.
11. Minsk.
12. Polotsk.
13. Kirishi.
14. Mozyr.
15. Kiev.
16. Unecha.
17. Moscow.
18. Yaroslavl.
19. Ukhta.
20. Ustinsk.
21. Odessa.
22. Kherson.
23. Kremenchug.
24. Ryazan.
25. Gorkiy.
26. Minchurinsk.
27. Litchansk.
28. Novorossiysk.

[Key continued on next page.]

29. Tuapse.	40. Tyumen.	51. Shevchenko.	62. Chardzhou.
30. Tikhoretsk.	41. Tobolsk.	52. Baku.	63. Chardara.
31. Volgograd.	42. Nizhnevartovsk.	53. Uzen.	64. Chimkent.
32. Saratov.	43. Yakutsk.	54. Enba.	65. Tashkent.
33. Kuybyshev.	44. Kurgan.	55. Omsk.	66. Alma-Ata.
34. Kazan.	45. Batumi.	56. Krasnoyarsk.	67. Fergana.
35. Izhevsk.	46. Groznyy.	57. Krasnovodsk.	68. Komsomolsk-na-
36. Perm.	47. Tbilisi.	58. Nebit-Dag.	Amur.
37. Shaim	48. Gur'yev.	59. Karaganda.	69. Khabarovsk.
38. Surgut.	49. Orsk.	60. Pavlodar.	70. Yuzhno-
39. Ufa.	50. Makhachkala.	61. Irkutsk.	Sakhalinsk.
			71. Okha.
A. Pechora.	D. Yenisey.	G. Angara.	J. Amudarya.
B. Kama.	E. Nizh. Tunguska.	H. Irtysh.	K. Volga.
C. Ob.	F. Lena.	I. Syrdarya.	L. Amur.

In the area of drilling, two main practical tasks face the oilfield workers: reduction in the time required to drill wells, and increase in the quality of touchdown in productive oil and gas formations that provides for preservation of the natural productivity and flow of the wells. In order to solve these tasks, a radical improvement in the area of developing and producing effective chemical reactants for regulating the properties of drilling muds in the required variety and amount will be of great importance.

An analysis of the factual data indicates that touching down in productive formations and rinsing with poor-quality muds reduces the recovery potential of wells 1.5-fold to 2-fold. Processing the drilling muds with protective reactants (metas, KMTs [karboxymethylcellulose], M-4 and others) will enable successful drilling where bottom hole temperatures and mineralization are high. The use of hydrophobic emulsions based upon ABDM-chloride for touching down will enable the wells' collecting properties to be retained.

In the modern era, and especially in the long term, improving the processes of developing oilfields is of great importance. Successful development of the oil industry owes much to the introduction of progressive domestic development systems that call for artificial stimulation of the formation. The Soviet Union is in first place in the world in scale of use of waterflooding methods for maintaining reservoir pressure. At the same time, this method can no longer provide for a qualitatively new leap in oil recovery, especially in the area of increasing withdrawal. Therefore, the basic aim of scientific and technical progress in the oil industry—more complete removal of the crude from the ground—will be associated with the introduction of new methods for increasing withdrawal from the formations.

Technological processes for stimulating formations by chemical and thermal methods are being given first priority here. Various chemicals with slow adsorption capability and high chemical stability when in contact with the rock, which are biodegradable at the surface, are required for it. Also necessary are new, more complex operating equipment, and in many cases even an additional buildup of facilities at the fields. There is an integrated specific-purpose program for creating and using widely various methods and technical means for increasing withdrawal, in many regions industrial-test work is being done, and the technology of the processes is being studied.

However, oilfield workers have encountered difficulties on this path and will encounter still greater difficulties in the future, since the new methods are more complicated than traditional waterflooding, both in the technology and in the mechanism for stimulating the oil deposit. Because of this, a high theoretical level of research that will enable a choice of the most effective stimulation technologies is necessary.

Special attention will be paid in the near term to the problem of stripping depleted fields that have gone through the waterflood stage. Although according to currently existing technology they have been exhausted, a substantial share of the oil reserves will still remain underground. Drawing these oil resources in built-up areas into development is a most important task for the whole national economy. Such a promising field as the use of highly active chemical products, micellar solutions, carbonic acid and other reactants will have a major role in solving it.

The chemical, petrochemical, microbiological, machinery-manufacturing, power-engineering and other branches of industry, as well as USSR Academy of Sciences institutes, should extend active assistance in the wide introduction of new methods for increasing oil withdrawal.

During the 11th Five-Year plan the operational well inventory will grow 1.5-fold and will reach about 129,000 wells. About 90 percent of this large number of wells will be operated at the end of the five-year plan by the mechanized method (basically by UETsN's [electrical centrifugal pump installations] and SShN's (sucker-rod pumps)). With the great growth in the well inventory and with change in the structure of operating methods, increase in time between repair of wells becomes of paramount importance. This is directly associated with the rise in the technical characteristics and reliability of the pumping equipment, the correct choice thereof, the establishment of optimal pumping regimes and an improvement in the operating conditions during utilization. In this case, repair-work quality must be improved still more, and the main criterion for successful work by current-repair brigades should be a reduction in the number of wells idled.

An important prerequisite to increasing the time between well repairs is the introduction of the gaslift method of operation, which is less labor intensive (in comparison with pumped recovery) when it comes to servicing and repair. Plans call for the introduction also of another promising method of recovering oil--by means of the piston-type hydraulic pump.

Our country has a large pipeline system at its disposal. The present length of trunk pipelines and of the pipelines within the oilfields runs to hundreds of thousands of kilometers. During the 11th Five-Year Plan it is planned to construct 8,000 kilometers of new trunk pipelines. Basically, they will be of large diameter and are intended for transporting oil from the West Siberian, Komi ASSR and West Kazakhstan regions. Almost all the trunk pipelines have electrochemical protection from corrosion, which provides for a high degree of operating reliability.

A characteristic of operating pipelines within the oilfields is the aggressiveness of the liquids and gas being pumped, as a result of which substantial resources are expended in the drive against the results of corrosive destruction. Pipeline protection can be improved considerably, primarily by means of coatings (both internal and external) that are applied at the mill, but not under field conditions (especially during winter in the North).

An important factor in recovering and transporting oil and gas is the comprehensive application of chemicals to operating processes. The use of reactants in the drive against the deposition of salts, paraffin, and corrosion inhibitors creates economical conditions for operating the equipment, stabilizes oil recovery, and increases the equipment's service life. Corrosion inhibitors and protective anticorrosion coatings sharply reduce the intensity of corrosive destruction, increases equipment service life 2-fold to 3-fold, and reduces expenditures on the elimination of corrosion-caused breakdowns 1.5-fold to 2-fold.

The effectiveness of applying chemical products and their economical consumption depend greatly upon the scientific and technical level of the branch's skill in using chemicals. In each specific case it is necessary to present accurately the rationale for using a chemical reactant and not allow them to be used for the wrong purpose. For this reason, precise directives should be developed for use of the whole spectrum of chemical products employed in the industry, which is the task of the NPO [Science and Production Association] Soyuzneftpromkhim [All-Union Association for the Application of Chemical Methods to the Oil Industry], VNIIOENG [All-Union Scientific-Research Institute for the Organization of Management and Economics of the Oil and Gas Industries], the NPO Soyuzneftpromkhim, VNII [All-Union Oil and Gas Scientific-Research Institute], VNIIBT [All-Union Scientific-Research Institute for Drilling Equipment], VNIKRneft' [All-Union Scientific-Research Institute for Oil-Well Casing Operations], Giprovostokneft' [State Scientific-Research and Design Institute for the Oil-Recovery Industry of the USSR's Eastern Economic Region], and VNIPIgazpererabotka [All-Union Scientific-Research and Design Institute for Treating Natural Gas] should complete the development of consumption norms for chemical products for various operating processes in the first half of 1983.

An important problem is the more complete use of casing-head gas reserves and the creation of capacity for treating it. Much work has been done in the branch in recent years on the rational use of casing-head gas, and much capacity for treating it has been introduced in West Siberia, where gas-treatment plants have been built in accordance with modern operating schemes, using equipment of high unit capacity. This has enabled the area of the construction buildup to be cut, metals intensiveness to be reduced, and worker manpower to be decreased. Use of the gas reaches more than 95 percent at the old oil-bearing regions. During the 11th Five-Year Plan and during the next 10-year period, it is necessary to make more complete use of gas resources in the new regions, such as West Siberia and West Kazakhstan. An integrated solution is called for here that will provide for the balanced development of the whole gas activity's capacity.

It is planned to build, primarily in West Siberia, the required number of gas-gathering grids at new oilfields, compressor stations, including those that will inject gas into the formation, gas-treatment plants, and a West Siberia-Urals-Volga product pipeline. A special program is to be executed for treating hydrogen-sulfide containing gas at West Kazakhstan fields. The program's development is linked with the development of new technology for treating gas and for treating oil at oilfield facilities.

One of the most important areas of the work of oilfield collectives is that of improving the branch's economic mechanism in accordance with the well-known decree of the CPSU Central Committee and the USSR Council of Ministers. Much has been done in this direction: a reliable methodology has been created for the branch's planning, based upon operating schemes for developing the fields and upon the enterprises' charter documents, a branch system of indicators for planning and for

incentives has been worked out in which priority has been given to the final result--to tons of oil and cubic meters of gas, and the potential of cost-accounting interrelationships, based upon the new prices for crude, have been expanded considerably. Simultaneously with the new prices, a system of incentives for quality of the oil (per a sliding scale and price markups) has been introduced. The use of such a most important resource as labor is being planned and given incentives for the industry's indicator--specific labor expenditure for servicing per oil well. Construction commodity output has been introduced for Minnefteprom construction organizations, as has a similar indicator for drilling organizations. In 1982 a cost-accounting system of operation for the creation, mastery and introduction of new equipment was introduced, and design organizations were converted to cost accounting. Brigade forms for organizing labor, the combining of trades, and piece-work wage rates for oil-recovery work are being developed.

All this enabled production effectiveness to be increased in 1981, such measures to be considered in the plan for 1982 and to be called for in the plan for 1983, and the whole plan for the 11th Five-Year Plan period to be made up, being based to a great extent upon growth in quality indicators.

Nevertheless, not by far have all reserves for reinforcing organizational work and for improving the economic mechanism as a whole been realized. The basic deficiencies are: introduction of the methodological basis and of existing advanced experience has not always been purposeful and active at enterprise level, especially at the lower-level elements, and monitoring of the introduction required of the associations and the Minnefteprom staff has been lacking.

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CURRENT STATUS, PLANS FOR AZERBAIJAN OILFIELDS DISCUSSED

Moscow NEFTYANOV. KHOZYAYSTVO in Russian No 12, Dec 82 pp 15-20

[Article by B. A. Gadzhiyev, general director of Azneft' [Azerbaijan Oil Production Association]: "Azneft' Oilfield Workers—for the 60th Anniversary of the Forming of the USSR"]

[Excerpt] The highest level of oil recovery at the republic's oilfields was achieved during the 8th Five-Year Plan, and, during the Ninth, Azerbaijan oilfield workers were the first in the country to reach the billion mark for cumulative oil recovery.

During the Ninth and 10th Five-Year Plans the geography of oil recovery was sharply changed, and the republic's central and western regions were brought increasingly widely into exploration and development. Of 87,000 square kilometers of Azerbaijan's area, 49,000 square kilometers are promising for oil and gas, but, in 130 years of industrial development, only 28,000 square kilometers have been developed, and even then only the upper stages of the productive series. Because of this, Azneft' workers consider their most important task to be that of intensifying drilling at promising areas and promoting deep exploration in existing fields. The association's drilling enterprises are now prospecting for oil in 23 areas. The cluster-type slant-directional drilling method, besides saving time, funds, labor and metal, enables preservation of the republic's unique nature. For example, the forest tract in Siazan and the preserve in Muradkhanly. The republic's central and western regions, which are being drawn increasingly into the sphere of oil production, have long had a reputation for wealth of flora and fauna. The work being done by the association to preserve the environment and to convert wells to derrickfree operation and to tank-farmfree gathering of crude is vitally important to them. The interriverine area of the Kura and Iori and the Sazhdag, Damirtepe-Udabno, Amirarkh and Zardob areas are the regions that Azneft' oilfield workers are developing.

The promotion of geological exploration in the republic's regions will enable solution of the most important task posed by the "Main Directions for the Economic and Social Development of the USSR During 1981-1985 and During the Period up to 1990," which called for a buildup of oil and gas reserves in order to stabilize recovery thereof. Azneft' oilfield workers will increase penetration volume by 46 percent for exploratory drilling and by 38 percent for development drilling during the 11th Five-Year Plan. The increase in development drilling will simultaneously permit the withdrawal of the remaining oil to be increased at the Apsheron fields, which have been under development for a long time, and expansion of the area of

introduction of progressive methods for increasing the withdrawal of oil from the formations. It must be noted that the distribution of oil reserves and of the existing well inventory over the fields and stages of Apsheron's productive strata is such that only 33 percent of the existing wells are in the lower stages, where the major portion of the reserves are now being extracted, while 67 percent of the wells are working upper stages. This disproportion not only reduces the pace of withdrawal of the remaining oil but it also prevents the wide introduction of progressive methods for stimulating the oil formations. In this connection, AzNIPI-neft' [Azerbaijan Scientific-Research and Design Institute for the Petroleum Industry] specialists have prepared more than 40 designs for stripping existing fields and have found more than 6,000 points for additional drilling, in order to eliminate the indicated discrepancy. Moreover, during the current five-year plan for stabilizing the republic's oil recovery, work is being done at the Apsheron fields, which have been operating for a long time, to introduce such highly efficient methods of intensification as steam stimulation, the use of surfactants and various chemical reactants, the creation of an in-situ combustion front, and others. The conversion of certain oilfield facilities to shaft-mining and to strip-mining methods of operation will also help to increase oil recovery. Erection of the country's second underground oil mine was started at the oldest Balakhna oilfield during the 10th Five-Year Plan.

Its introduction into operation will enable solution of the problem of raising the final oil withdrawal factor at this oilfield.

"The oil industry has been and remains one of the leading branches of the republic's economy," emphasized Candidate Member of the CPSU Central Committee Politburo, First Secretary of the Azerbaijan Communist Party Central Committee G. A. Aliyev at the 30th Congress of the Azerbaijan Communist Party. "During the 11th Five-Year Plan its role and significance as a supplier of raw materials for the oil-refining, petrochemical and chemical industries will increase still more. Therefore, the job is not only to stabilize oil withdrawal but also to increase it through wider introduction of progressive methods for intensifying recovery and for developing new fields, offshore and on land."

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CURRENT STATUS, PLANS FOR TATARIA'S OILFIELDS REPORTED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 20-24

[Article by A. K. Mukhametzyanov, general director of Tatneft' [Tatar Oil Production Association]: "Tatariya--for a Worthy Greeting to the Anniversary"]

[Excerpts] In greeting the glorious 60th anniversary of the forming of the USSR, Tataria's oilfield workers, along with all the Soviet people, are persistently and purposefully implementing the 26th CPSU Congress's historic decisions and 11th Five-Year Plan tasks. In the first 9 months of this year the republic's oilfields yielded 200,000 tons of oil, 11 million cubic meters of casing-head gas and 24,000 tons of light, wide-fraction hydrocarbons above the plan.

In working under the slogan, "In each 10-day period--300 tons of oil above the plan," the NGDU [Oil and Gas Recovery Administration] collective of Suleyevneft' [Suleyev Oil Production Association] carried out the annual commitments for above-plan oil recovery on 18 May 1982 and decided to produce at least 6,000 more tons above the plan by the end of the year. The NGDU's of Aznakayevskneft', Prikamneft', Nurlatneft' and Yamashneft' coped with the annual commitments for above-plan oil recovery ahead of time. The brigade of foreman T. M. Il'yasov of the Menzelinsk UBR [Drilling Administration], which is working in West Siberia under the rotating-duty expeditionary method, completed fulfillment of the two-year plan for well construction on 27 June 1982.

Brigades for drilling wells, recovering oil and gas and repairing wells are greeting the anniversary with high labor achievements. The great contribution that Tataria's oilfield workers have made to strengthening the country's fuel and raw-materials potential is well known. At the end of 1981 they were the first in the country to recover its 2-billionth ton of oil from the republic's ground.

During the 11th Five-Year Plan the association's drilling enterprises are to solve the tasks of increasing the effective drilling speed and penetration per brigade and reducing well-construction time. In developmental drilling, in particular, effective drilling speed will be brought to 2,400 meters per rig per month, penetration per bit to 95 meters, and average time for building a well to 30 days. For this purpose low-rpm drilling and the use of new highly productive bits must be expanded, the technology for sinking wells must be improved, the time spent eliminating complications must be reduced, and the organization and system for controlling drilling work must be improved.

At the same time, precision work by each service and each production collective and highly productive work by all drilling brigades are required.

At all stages of development of Tataria's oil industry, scientists and production workers have constantly paid attention to improving development of the fields. The main measures have been optimization of the width of the areas that are allocated for independent development; wide introduction of spot waterflooding as a more effective method of bringing into active development reserves located at sections that are isolated from the injection rows; optimization of water-injection pressure; selective transfer of the injection front; the use of a selective system for waterflooding; and change in the direction of filtration flows in the formations.

A set of these measures has enabled the main reserves of highly productive formations to be brought into active development during the last two decades.

However, reserves that are difficult to extract are being worked at a slow pace or are not being worked at all. In order to intensify their development, it is planned to create an independent system for waterflooding with an increase in water-injection pressures of up to 25-30 MPa, to drill holes of strengthened construction, and to reduce the permeability of the water-saturated parts of the formations.

Before the 1970's, growth and maintenance of a high level of oil recovery in the Tatarskaya ASSR was accomplished mainly by introducing new fields and intensifying the development of fields already in operation. However, this is not enough in the modern era. Work on increasing the degree of extracting oil from the ground must be intensified. The association began to get engaged in research, development and oil-field testing of new methods for increasing withdrawal from formations back in the middle 1960's. Since 1977 these operations have been carried out on the basis of long-term integrated work programs made up by the association and TatNIPIneft' [Tatar State Scientific-Research and Design Institute for the Petroleum Industry], in the development of which more than 10 vuzes and scientific-research institutes of the republic and of the industry took part. During these years more than 3,000 wells were included in methods for increasing withdrawal. Additional oil recovered by using these programs during the 10th Five-Year Plan came to 2.6 million tons. It is planned to expand the scale of introduction of physico-chemical and thermal methods for stimulating oil reservoirs during 1981-1990.

One of the main tasks of Tataria's oilfield workers is systematic improvement of well inventory utilization by optimizing cooperative working of the oil formation and of well equipment. The association has created specialized bases for production servicing that will repair, assemble and rent out ETsN [electrical centrifugal pump] installations, overhaul pumping jacks and NKT [tubing], and treat rods with high-frequency currents.

In order to retain well productivity during repair, a decision was made to convert completely during 1981-1983 to killing wells with hydrophobic emulsion solutions. In 1982, six of the 12 NGDU's had installations specially built for these purposes. A job order-free system for organizing the work, giving incentives for it, and a system for planning the work and using special equipment for each operation are being introduced into current-repair practice. This has enabled the time between the repair of mechanized wells to be increased and the number of current repairs to be reduced. For example, during the first half of 1982, 500 fewer repairs were conducted than during the corresponding period of the previous year, with a simultaneous reduction of the idle-well inventory. The association's task--

that of bringing the period between repair of wells equipped with ETsN's up to 500 days and with SShN's [sucker-rod pumps] up to 360 days—is being carried out successfully.

One of the severest problems that faces Tataria's oilfield workers is the struggle against the corrosion of oilfield equipment and structures. The association has created a service for the cathodic protection of operating well strings and the use of polymer coatings on NKT, pumps and operating equipment; and corrosion inhibitors are being used.

However, all these measures do not solve the problems completely. In this connection, the association has begun to use polyethylene and a special glass composition in the internal insulation of pipe that is used in the PPD [reservoir pressure maintenance] system when drain water is utilized. The technology was developed by TatNIPIneft'. This year the construction of an installation for manufacturing metal-and-plastic pipe 100 and 150 mm in diameter with a productivity of 300 kilometers per year will be completed. In 1983 the erection of an installation of the same productivity for the internal coating of glass pipe 250-400 mm in diameter will be started. The guaranteed service life of these pipes in a brine-water environment is at least 15 years.

In recent years the association has also done much in other areas. More than 98 percent of all crude is now recovered and more than 80 percent of it is turned over in the first quality group, based upon the use of oilfield equipment that has been automated in integrated fashion. By reequipping production facilities and improving work organization, specific labor expenditure on well servicing has been reduced systematically.

Tataria's oil industry has exerted a decisive influence on the economic and cultural development and growth in the welfare of the autonomous republic's workers. At present, 75 percent of the power-engineering facilities, 50 percent of the agricultural and production facilities, and almost all municipal and domestic-services and industrial facilities in Tataria use casing-head gas. About 90 percent of the populace in cities and workers' settlements and about 80 percent of the rural population are being provided with gas for household purposes.

The social face of Tataria's southeastern section, where most of the association's enterprises and organizations are located, has changed radically. Here modern cities and settlements for oilfield workers have risen up. Oil has helped to develop the older towns of Bugulma and Elabuga. Each year more than 2,000 well-appointed apartments are built for oilfield-worker families. Twenty polyclinics, 23 hospitals, 9 sanatoria and dispensaries, 26 Palaces of Culture, and housing for technology and clubs have been built. For children, 70 preschool institutions, 82 schools and 11 Pioneer camps have been built.

Each year more than 11,000 oilfield workers and members of their families are provided with tickets to sanatoria and vacation housing. A large therapeutic and health-improvement complex for the association's workers is being built on the Black Sea shore of the Caucasus.

The collective of many thousands of oilfield workers—an advanced detachment of the republic's working class—has been brought up and indoctrinated under the supervision of the oblast party organization. The association's workers and specialists, in close collaboration with workers of interdependent organizations, have shown

selflessness in work, creative initiative and a high feeling of responsibility at all stages of the industry's development. Their labor achievement in the drive for the most rapid recovery of the 2-billionth ton of oil received a high assessment from the CPSU Central Committee. The warm, heartfelt words and kind wishes expressed to them in the greetings have inspired the association's workers to new and glorious deeds.

In the forthcoming period, important tasks face Tataria's oilfield workers. During the five-year plan more than 305 million tons of oil are to be recovered. The republic's earth has adequate resources available, and they must be used thriftily in support of a further increase in production efficiency and work quality.

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MANGYSHLAK OIL INDUSTRY'S PROBLEMS, PROSPECTS TOLD

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 27-30

[Article by A. A. Dergachev, general director of the Mangyshlakneft' Association [Mangyshlak Oil Production Association]: "The Contribution of the USSR's Union and Autonomous Republics to Mangyshlak's Oil-Industry Development"]

[Excerpt] During the 11th Five-Year Plan drilling will start at new oilfields: Tasbulat, Dunga, Tenge, Aktas, Turkmenoy and Burmasha. Work to improve the development of the fields will see further progress, primarily an increase in the amount of water injected into the formations, from 59 million cubic meters in 1981 to 73 million in 1985.

In 1982 reconstruction of the PPD [formation pressure maintenance] system will be completed at the Uzen field. This will enable complete conversion to hot-water injection. The PPD system covers the fields of Tenge and Yuzhnyy Zhetybay. During the current five-year plan 954 wells will be transferred to injection operation.

The introduction of new methods for increasing withdrawal will increase. At the Uzen field this will be selective thermal step and cyclic stimulation of the formation and the injection of PAV's [surfactants]; at the Kalamkas field--the injection of thickened water; and at the Karazhanbas field--the injection of steam and the creation of an in-situ moving combustion front. By the end of the five-year plan 1,159,000 tons of crude will be recovered at the Karazhanbas field alone by the introduction of these methods.

The use of chemical means in all operating elements of oil recovery will increase.

An indispensable prerequisite for further improvement in developing deposits and bringing new oil reserves into recovery is an increase in the inventory of operating wells, which reached 5,422 in 1985 instead of the 2,675 of 1980.

The introduction of 3,148 new wells requires much capital investment on their construction, the buildup of facilities for operation by mechanized methods, and the provisioning of facilities for gathering and treating the oil. In this connection, searches for progressive methods for doing the work must be made, which, in our opinion, consists in the wide introduction of slant-directional and cluster drilling. This will change considerably not only the equipment and technology for building wells, but also the buildup of oilfield facilities for them and of later operations. The amounts of mechanized recovery, primarily by deep pumping, will grow. Gaslift will be further developed at existing fields and at fields that will be introduced.

Realization of the tasks that have been posed will require increasing amounts of capital investment. However, this cannot grow without limit, so Mangyshlak oil-field workers are being guided by the 26th CPSU Congress's instructions that capital investment should go primarily to rebuilding and reequipping enterprises. In this connection, more economical designs for rebuilding gaslift systems at the Uzen and Zhetybay oilfields and the technical reequipping of the Kazakh GPZ [Gas Treatment Plant] have been substantiated and are being implemented. However, this work has been proceeding slowly (since 1978). The rebuilding of existing facilities for treating oil is being completed. More improved solutions for facilities for treating oil have been substantiated for the Kalamkas field. Reconstruction of the Alb'-Cenomanian water-intake at the Uzen depression and conversion of the wells to the gaslift method of operation are planned.

The "Main Directions for the Economic and Social Development of the USSR During 1981-1985 and During the Period up to 1990" call for an expansion of geological exploration for oil and gas in West Kazakhstan. Guided by party and government instructions, Mangyshlak's oilfield workers will, during this five-year plan, drill 370,000 meters of deep prospecting and exploratory wells, or 57,000 meters more than during the 10th Five-Year Plan, and industrial category reserves will increase by 25 prepared promising areas, with the assimilation of 134.2 million rubles of capital investment for deep drilling alone.

Prospecting and exploration of new oil and gas fields will be performed in the Triassic and Paleozoic sediments in the Peschany-Myssko-Rakushechnaya zone, the Zhetybay-Uzen interval, and a zone of reef-uplift development.

In comparison with the well-known fields in Jurassic sediments, exploration of the new deposits of oil and gas in Triassic and Paleozoic sediments will be greatly complicated because of the poor extent to which the region has been studied, the great depth of deposition of the targets (up to 6,500 meters), and high temperatures. Therefore, further improvement of the methodology and organization of prospecting and exploration for oil and gas becomes necessary here.

Exploratory drilling where there is anomalously high temperatures and pressures requires that heat-resistant weighted muds with high physico-chemical properties be developed. This region needs the help of subdivisions of the Kazakh SSR Academy of Sciences and also of specialized oil-industry institutes. It goes without saying that help is also needed from scientific organizations of Azerbaijan, the RSFSR, Tataria and Bashkiria.

For Mangyshlak, with the peculiarities in the development of its fields, it is very important to strengthen the ties of science with production. In recent years a large amount of work has been done to introduce the achievements of chemistry into the operating processes of oil recovery. A science-and-production association was created in Kazan and its administration operates at Mangyshlak. The industry's institutes are performing urgent research and are giving production work definite suggestions. As a result, much has been done to prevent paraffin and salt deposition, to reduce the activeness of corrosive processes, and to suppress bacterial activity.

A paramount problem for Mangyshlak has always been water. With the discovery of fields on the Buzachi Peninsula, its importance has risen severalfold. The association has several engineering solutions for water-supply sources, but the most promising of them is the delivery of fresh water from the Volga River. A decision on Mangyshlak's water supply and a start at realizing a design should be speeded up.

During the 11th Five-Year Plan, for the first time in the Soviet Union, the newest methods for developing viscous-crude fields--injecting steam and creating an in-situ moving combustion front--will be introduced on a large industrial scale. Realization of the advanced technology requires use of the appropriate equipment. However, the association still has to build up capacity through an increase in the number of facilities, supplying them with adequately powerful equipment.

The achievements of the Mangyshlak Regional Production Complex's oil industry have helped to develop other branches of the economy, particularly the chemical industry. The Kazakh GPZ [Gas Treatment Plant], which produces gaseous natural gasoline and other hydrocarbon fractions, on the basis of which the world's largest plastics plant for obtaining shock-resistant high-quality polystyrene has been built, has been put into operation.

Thus, the Mangyshlak Regional Production Complex is acquiring ever-increasing importance in the development of the country's economy. It is proposed to create later a metallurgical industry in the oblast, based upon the separation of metallic vanadium from the oil of the Buzachi Peninsula fields.

The republic's scientific-research and design organizations should help greatly in the wide use of Mangyshlak's resources.

The creation of an industrial base at Mangyshlak has changed the whole face of the peninsula, especially the agricultural structure. The rural population has begun to benefit from the railroads and highways, some rural regions have been connected to the industrial gas- and water-supply systems and the electrical grid, and they are enjoying television and radio. The association is doing much work to improve the social and domestic living conditions of the workers.

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ENHANCED OIL RECOVERY METHODS OF UKRAINE DESCRIBED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 30-33

[Article by S. N. Gorev, general director of Ukrneft' [Ukrainian Oil Production Association]: "The Ukraine's Oil Industry—for the 60th Anniversary of the Forming of the USSR"]

[Excerpts] An integrated program of organizational and technical measures for developing drilling work and for improving its technical and economic indicators has been made up jointly with Ukrigiproniineft' for the 11th Five-Year Plan. Accomplishment of the contemplated set of measures will enable speed in developmental drilling to be brought up to 400 meters per rig per month, and in exploratory drilling—up to 300 meters per rig per month, that is, by 18 and 19 percent, respectively, greater than in 1980.

In carrying out 26th CPSU Congress decisions on developing the oil industry in West Siberia, the Ukraine's drillers are extending fraternal assistance to Tyumen oil-field workers in developing the oilfields. Collectives of the Ivano-Frankovsk UBR [Drilling Administration] and the Dolinsk UTT [Solid Heat-Transfer Medium Installation] are laboring successfully there. Despite the complicated climatic conditions, the Ukraine's drilling brigades, working by the expeditionary rotating-duty method, have mastered the technology of drilling wells with good indicators. In a short time they drilled more than 1.3 million meters at the Severo-Var'yegansk field and turned 380 wells over to the operators. The Ivano-Frankovsk UBR collective was awarded the challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, and it has been entered on the All-Union Honor Plaque for its 1981 results.

In recent years Ukrneft' has been doing much work to improve systems for developing fields, to improve the utilization of oil and gas well inventories, to reduce the time taken to build oilfield facilities, and to introduce new wells into operation. One of the main problems has been the more complete extraction of oil from the ground.

Taking into account the geological structure and the hydrodynamic conditions for deposition of the fields, the association is using widely varying waterflooding systems—area flooding (the Dolinsk and Orov-Uluchnyanskoye fields, spot flooding (the Novogrigor'yevskoye and Borislavskoye fields), contour flooding (the Lelyakovskoye field), perimeter flooding (Chizhevskoye and Starosamborskoye fields), cyclic pumping of water and shift of directions of the filtration flows (the Gnedintsevskoye, Lelyakovskoye, Bitkovskoye, Dolinsk, Strutynskoye, and Spasskoye fields)—

that is, practically all the varieties of methods known to domestic and foreign practice.

Each year the amount of water injected into the reservoirs grows. While 12.1 million cubic meters were injected in 1976, 15.4 million cubic meters were injected in 1981. Seventeen fields are being developed with maintenance of formation pressure by injecting water, and the oil recovered from them is about 50 percent of the association's total volume. Waterflooding, especially at Carpathian fields, doubles withdrawal.

At fields of the Ukraine that are marked by low-viscosity crudes and by low collector characteristics of the formations, industrial test work on the introduction of thermal and physico-chemical methods of stimulation is being performed. Industrial test work on injecting steam is being performed at sections of the Borislavskoye and Skhodnitskoye fields. A wet in-situ combustion front is being formed at a completely depleted and water-encroached section of the Gnedintsevskoye field.

Oil formations are being stimulated with a gas-and-water mix at the Bitkovskoye field, and water with a PAV [surfactant] solution is being injected at the Strutynskoye and Starosamborskoye fields. Along with this, the association is working jointly with scientific-research organizations on substantiation of the use of micellar solutions and carbon-dioxide gas and the injection of hot water at Ukrainian fields.

Industrial-test studies indicate that methods for increasing withdrawal at fields with low-viscosity crudes give positive results. An additional 330,000 tons of crude were recovered during the 10th Five-Year Plan by introducing the methods, and 67,300 tons were thus obtained in 1981.

The conversion of oilfields to the last stage of development and intense water encroachment have required a major complex of operations on the effective use of the well inventory. In order that the equipment and the recovery potential of the oil wells may be used better, the association is optimizing their operation by the application of computers. In 1981 the operating regime of 244 wells were optimized and an additional 42,700 tons of oil were recovered.

The productivity of wells is raised by stimulating them at the bottom hole zone. Hydraulic fracturing of the formation, various modifications of acid treatments, thermal treatment, PAV treatment and so on have been used most widely. In 1981 more than 500 such treatments were made, and, as a result, more than 120,000 additional tons of oil were recovered.

In order to increase the removal of liquid from the formation, submerged electric pumps and gaslift operation of the wells are being used widely. The share of these recovery methods was 40 percent of the total in 1981 and more than 60 percent of the recovery by mechanized methods.

Much attention is being given to the repair of wells and to increasing operating time between repairs. The operating factor has been brought up to 0.977, one of the highest in the branch.

The development of oil and gas recovery has changed radically the face of the republic's oil regions. The city of Borislav has become unrecognizable, and the cities of Dolina, Nadvornaya, Akhtyrka and Priluki are growing, and they are

being improved. Convenient housing, new schools, children's institutions, stores, dining halls and cultural and domestic-amenity facilities are being built here. In the last 6 years alone about 100,000 square meters of living space were built, housing conditions were improved for 1,460 families, and the network of children's preschool institutions was expanded by 775 places, hostels by 360 places, centers for recreation by 250 places, and Pioneer camps by 100 places. The health of about 6,000 workers is being improved at sanatoria and recreation centers.

After mounting a labor drive in honor of the 60th anniversary of the forming of the USSR, the Ukrneft' Association collective adopted high socialist commitments and decided to give the country 27,000 tons of oil and 45 million cubic meters of gas above the plan in 1982. The Ukraine's oilfield workers, investing all their efforts, knowledge and experience, are greeting the motherland's glorious anniversary worthily with labor successes.

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PROBLEMS, PROSPECTS FOR GEORGIA'S OIL INDUSTRY SURVEYED

Moscow NEFTYANOYE KNOZYAYSTVO in Russian No 12, Dec 82 pp 39-42

[Article by R. N. Tevzadze, general director of Gruzneft' [Georgian Oil Production Association]: "Georgia's Oil Industry"]

[Excerpts] Oil was recovered in Georgia, although not in large quantities, back in the 19th Century. It was obtained from upper horizons that were insignificant in reserves, from a depth of about 20-30 meters. The first local and foreign industrialists began to drill shallow wells in East Georgia back in 1862. Later, in 1877, a well was also drilled for oil in West Georgia.

The well-known information about the existence of oil recovery in Georgia by the mining, shaft, and well methods coincided practically with the organization of its recovery by similar methods on the Apsheron Peninsula. However, while a large oil industry was created in Azerbaijan in a time that was comparatively short, from a historical point of view, systematic prospecting for oilfields in Georgia was begun only in the 1930's, when the Gruzneft' Trust was created.

Between 1930 and 1973, 440 exploratory and prospecting holes were drilled in 42 areas, exploratory drilling totaled 751,000 meters, and more than 200 million rubles of capital was invested. In so doing, altogether eight small-flow oilfields were found, the oil recovery from which was extraordinarily small. At the start of the 1970's it became unprofitable, the return on capital being exceptionally low. Expenditures per ruble of commodity output was 94.6 kopecks.

However, despite the low effectiveness of geological exploration, geologists and specialists, as before, assessed Georgia's prospects highly. Back in December of 1934, Academician I. M. Gubkin said at the All-Union Geological Conference in Moscow that there was every basis for considering the establishment of an independent oil base in Georgia. The well-known scientist and great expert on Azerbaijan's oil geology, D. V. Golubyatnikov, after studying the geological structure of Georgian regions on the spot, wrote in a special work dedicated to the prospects of its petroliferousness: "In recent years geological exploration has given so much that is new that the continuation of this work on a broad scale is an urgent necessity. If geological exploration is continued at such a pace or more rapidly, then the finding of favorable structures will certainly increase, and one will then have to say that Georgia is rich not only in oil shows but it also has favorable structures and will give us new regions to replace the old Baku and Grozny regions."

The restructuring of work methods, beginning in the second half of 1973, gave positive results by 1974. It was in that year that the Samgori, an oilfield of

industrial significance, was discovered, giving impetus to further development of the republic's oil industry.

For the first time in many years, in 1974 Gruzneft' carried out the state plan for all the basic types of activity, and then also successfully completely met the five-year plan goals. Minnefteprom [Ministry of Petroleum Geology], the Georgian Communist Party Central Committee and the republic's Council of Ministers extended constant and active assistance to the oilfield workers, enabling the work indicators to be improved sharply in a short time. Drillers of Checheno-Ingushetia and Krasnodarskiy Kray extended and have continued to extend great fraternal assistance in the development of new oilfields.

Back during the 10th Five-Year Plan, the amount of oil recovery increased 29-fold over the preceding five-year period, or 8.5-fold more than for the whole 1930-1973 period. Such a rate of growth would have been impossible without a sharp increase in drilling work. While 117,100 meters of deep wells were drilled during the Ninth Five-Year Plan, 469,100 meters were drilled during the 10th Five-Year Plan by the forces of three associations (Gruzneft', Grozneft' and Krasnodarneftegaz), that is, 4-fold as much. During this period, the construction of 150 holes, 111 of them exploratory, was completed.

Development of the republic's oil industry during the 10th Five-Year Plan was accompanied by a substantial growth in capital investment. While 48.4 million rubles of it were assimilated in 1971-1975, during the 10th Five-Year Plan the amount assimilated was 143 million rubles, and the introduction of fixed capital increased 5-fold. During the 10th Five-Year Plan alone, almost as much capital was assimilated as in the period 1930-1973. Most important oil-recovery facilities were put into operation, primarily the head gathering point at the Samgori-Patardzeuli field and the Samgori-Batumi oil pipeline, over which all the oil recovered is transported to the Batumi oil refinery. Development of our own oil base has enabled this refinery to be loaded to about two-thirds of its capacity. Now practically all the output produced by the Batumi Oil Refinery is used for the needs of Georgia's economy, enabling regular delivery of fuel and lubricants and greatly reduced losses and idle time in transport work.

It is planned to develop Georgia's oil industry further during the 11th Five-Year Plan. Geological exploration is to be intensified, and oil recovery is to grow, for which purpose prospecting and exploration will be boosted. The task for growth of oil and gas reserves and for strengthening the successes achieved are to be resolved directly through a further increase in drilling volume and an increase in drilling effectiveness. Tasks for Gruzneft' Association, and for the Grozneft' and Krasnodarneftegaz Associations, which are working within Georgia, have been defined, and prospecting for promising fields in the east and west of the republic is called for. It is planned to drill 715,000 meters during the 11th Five-Year Plan, or 1.5-fold more than during the preceding five-year period, and, in so doing, the amount of work by our own forces will grow 1.9-fold.

In order to carry out tasks for growth in drilling-work volume, the construction and introduction into operation of NGDU [oil and gas recovery administration] production bases, geological-prospecting and plugging offices, SMU's [construction and installing administration, VMK's [derrick-erecting combines], UPTO's [administrations for servicing production equipment], KO's and bases in the Vaziani and Lilo regions, which were carried over from preceding years, are to be completed, and, moreover, the construction of production bases for the newly established Kartaly

URB [exploratory drilling administration] and UTT [solid heat-carrier installation] and bases for PTO [vocational and technical school] and KO in the city of Kaspi is to be provided for.

Like all the country's workers, Georgia's oilfield workers are working on realization of decisions of the 26th CPSU Congress and of later CPSU Central Committee plenums. A broad program of practical measures aimed at increasing production efficiency, improving the economic mechanism, introducing new incentive measures, and stimulating the achievement of high final results of the activity have been planned and are being carried out. Workers of the association's enterprises and organizations are applying all their efforts and are showing innovation and initiative in the search for new ways to save on the consumption of crude for in-house needs and to make wise use of materials, power and labor resources. They are studying and borrowing the advanced production experience of fraternal republics with great motivation.

Development of the oil industry in the republic is being accompanied by a constant improvement of social, cultural and domestic-amenity conditions for oilfield workers. During the 11th Five-Year Plan health-improvement complexes are to be built on the Black Sea shore and in Tsodoreti, a Pioneer camp is to be opened in Kiketi, a school and a kindergarten are to be built in the oilfield-workers' settlement in Tbilisi, and a polyclinic for 1,800 outpatients and hostels and housing are to be built. A petroleum building is also being built for the Georgian Polytechnical Institute.

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MORE EXPLORATION NEEDED TO STABILIZE OIL RECOVERY IN KIRGHIZIA

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, 1982 pp 43-45

[Article by V. E. Dikikh, general director of Kirgizneft' [Kirghiz Oil Production Association]: "Prospects for the Kirghiz SSR Oil and Gas Industry"]

[Excerpt] Although the present share of Kirghiz oil and gas in overall All-Union recovery is not great, the significance of each kilogram of crude oil and each cubic meter of gas recovered from Kirghizia's ground grows constantly because of the republic's economic development and the well-known difficulties in delivering fuel from other parts of the country. Kirghiz oilfield workers have set a target--to use the fields' resources and to increase production efficiency to the maximum, and to save material and financial resources in every possible way, in order to give the republic more oil and gas.

All the old fields are being developed with reservoir-pressure maintenance by area waterflood. In order to increase well productivity, especially in recent years, methods for intensifying liquid influxes from the formation (hydraulic fracturing on a petroleum base, thermochemical, alkali-and-acid, alkali-cement-acid and other treatments of the bottom hole zone) which give positive results are being used.

The conduct of these operational measures and the discovery in recent years of new oilfields in the Lyaylyak region have stabilized oil recovery somewhat.

Because of the nonconfirmation by the operating process of gas reserves previously estimated for the Maylisu IV and Izbaskent fields, depletion of the small gas reserves at the Suzak and Maylisu III fields, and the lack of new discoveries over a long time period, gas recovery has been dropping constantly. A realistic possibility for increasing gas recovery during the 11th Five-Year Plan appeared when gas-condensate output was obtained this year from Cretaceous sediments at exploratory holes 7SK and 9SK in the Severnyy Karakchikum area.

Local natural gas is being used for municipal and the populace's household needs in the republic's south and as a boiler and furnace fuel in industry.

Because of intensive development of the Kirghiz SSR's economy, the demand for gaseous fuel is growing constantly, and this also dictates the necessity to boost geological exploration for gas.

Kirghizia's ground contains potential oil and gas resources, but they are being converted extremely slowly into industrial reserves. The necessity for discovering new oil and gas fields in Kirghizia is being stimulated by the requirement to strengthen the fuel and power base with a view to increasing the republic's production of industrial and agricultural products, as contemplated by 26th CPSU Congress decisions.

Based upon the data of regional geological and geophysical work and upon concepts about the organic genesis of oil and gas, and also upon the basis of direct signs of petroliferousness, the areas most promising in the republic for finding oil and gas are the regions of the Fergana depression, which is included administratively in Oshskaya Oblast.

The main cause of the insignificant amounts of prospecting and exploratory drilling and of inadequate effectiveness of geological exploration is the lack of a reliable inventory of structures that has been prepared by the geophysicists for deep drilling. Prior to 1975 the republic's Geological Administration prepared structures for exploratory drilling by geophysical methods. Then this work was transferred to the Kirghiz Integrated Geophysical Expedition of the Saratovneftegeofizika Trust, which in 1976-1981 prepared seven structures, which were introduced to drilling at once.

In recent years additional steps were taken to increase geological exploration effectiveness, and this yielded some positive results. In the southwestern part of the Fergana depression (the Lyaylyak region) the new Karagach, Beshkent and Togap oilfields, and, to the northeast, the Chigirchik oilfield, were discovered, as were three new gas deposits at the Izbaskent and Suzak fields.

In June 1981 a practical-science conference on problems of increasing prospecting and exploration for oil and gas in the Kirghiz SSR was held at the Kochkor-Ata settlement. Taking part in its work were 78 specialists--representatives of the party, production and social organizations, and scientific workers of the republic. Especially valuable was the participation of oilfield workers and workers in science from the fraternal republics and the country's oil regions. This manifested joint interest and mutual assistance in development of the republic's economy.

With a view to discovering new oil and gas fields in Kirghizia and of increasing oil recovery, as well as of increasing geological-exploration effectiveness, the practical-science conference produced specific recommendations.

In particular, in order to increase geological exploration effectiveness, corrections must be introduced into the methodology of prospecting for oil and gas. Primarily, it was proposed that the front for exploration be expanded and that new areas and regions be introduced to exploration. First of all, prospects for the possible presence of oil and gas in the Naukatskiy, Uzgen and Isfarinskiy troughs should be clarified. The first prospecting and exploratory hole is now being drilled at the Bol'shoy Kyrkkol' in Naukatskiy Rayon is being drilled. One hole has been drilled at the Dosmetskaya area in Uzgenskiy Rayon, and geophysical work is being performed at the Isfarinskaya area and in the Uzgen-Naukatskiy and Bazar-Kurganskiy regions. Geochemical research is planned for the Narynskiy depression in the near future. It is proposed that the organization and methodology for doing seismic work in unison with geological prospecting be improved.

Kirghizneft' has worked out, jointly with SredAzNIPIneft' [Central Asia Scientific-Research and Design Institute for the Oil Industry] an integrated plan for geological exploration for oil and gas in the republic for the period up to 1990. During the current and next five-year plan periods, a continuous cycle of exploration, which calls for seismic exploration and structural, prospecting, exploration and appraisal drilling will be conducted in amounts that will exceed those of the 10th Five-Year Plan.

Understanding the exceptional importance of introducing scientific and technical achievements during prospecting and exploration, the development of oil and gas fields, the drilling of holes and other operating processes, the association's collective is working in close contact with both Minnefteprom [Ministry of Petroleum Industry] scientific-research organizations and other scientific organizations of the country. The Frunze Polytechnical Institute has extended much assistance, and recommendations of the Tashkent Polytechnical Institute on increasing well productivity are being introduced. Much work is being done by the Geological Institute of the Kirghiz SSR Academy of Sciences, where, in 1981, a special oil and gas laboratory was established in accordance with the recommendations of the practical-science conference.

Thus, an analysis of the status of oil and gas recovery and of geological exploration, drilling and scientific research in the Kirghiz SSR enables the following conclusions to be drawn.

The rate of drop in recovery can be reduced at Kirghizia oilfields that were discovered prior to 1960 by using new methods for increasing oil withdrawal and by drawing into development a poorly productive deposit--Formation III of the Paleogene of the Maylisu IV-Vostochnyy Izbaskent field.

The new oilfields in the Lyaylyak and Suzak regions that were discovered in 1974-1976, even though they are not large in size and reserves, will also permit a partial compensation for the drop in oil recovery at the older fields. Moreover, their discovery confirms the correctness of the directions chosen for geological prospecting and the possibility of discovering other fields with which the future development of the republic's oil and gas recovery industry is connected.

In so doing, the discovery of new fields of hydrocarbons depends greatly upon the successful work of geophysicists. It is necessary to use in the near future the newest geophysical equipment and methodology and to create a reliable inventory of promising structure for organizing deep exploratory drilling in a volume greater than today's. In using the recommendations of science, the main amount of prospecting and exploration must be concentrated at the more promising areas within the Fergana depression.

Kirghizia's oilfield workers, using the great experience that exists in other oil regions of the country and developing creative initiative, is devoting all its efforts to strengthening the republic's oil and gas recovery base.

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PROGRESS OF, PROSPECTS FOR CHECHEN-INGUSHETIA'S OIL INDUSTRY DISCUSSED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, 1982 pp 49-51

[Article by R.M. Khachaturov, general director of Grozneft' [Grozny Oil Production Association]: "A Meaningful Contribution of Checheno-Ingushetia's Oilfield Workers to Development of the Country's Economy"]

[Extracts] Checheno-Ingushetia's oil industry is just a bit under 90 years of age. In the fall of 1893 a mighty oil gusher struck from the first well drilled at the Groznenskiy Mountain Range (Staropromyslovskiy Rayon). The establishment of the second oil-recovery region, after Baku, which was making a major contribution to the country's economic development, was begun.

From the first days of the 11th Five-Year Plan the association's enterprises have been promoting the execution of a set of measures for further increasing the work efficiency of all elements of oil production and the unconditional fulfillment of plan tasks for all technical and economic indicators and socialist commitments that were adopted. During the 1.5 years that have elapsed under the current five-year plan, 119,000 tons of oil and 109.4 million cubic meters of gas above the plan were recovered, and the goals for drilling and other indicators were fulfilled.

Certain complicated problems connected with superdeep drilling in the Upper Cretaceous and Jurassic subsalt sediments are to be solved before the end of the five-year plan. Upper Cretaceous sediments will be explored in buried zones of the Peredovoy mountain ranges and in the area where the Tersko-Sunzhenskoye system of uplifts joints the Dagestan wedge.

Jurassic (subsalt) sediments are already being drilled into at certain areas of the western regions of Checheno-Ingushetia, and also at all structures of the Chernyye Gory, where an accumulation of hydrocarbon raw-material reserves has been hypothesized. At the same time, technical problems that are new for the republic's oilfield workers can arise here. This complex of sediments has not been well studied geologically and practically not at all geophysically. The depths of deposition of the subsalt sediments are 4-5 km in the Chernyy Gory and 5-9 km in the Peredovoy mountain ranges. The presence of hydrogen sulfide has already been observed in gas at the Dattikh area (4-6 percent), and even greater concentrations are forecast for the other areas.

Because of a deterioration of the collector properties of these sediments, testing of the wells, especially for signs of an influx, is a serious problem. The republic's oilfield and scientific workers are working on this right now. They should

also be ready to overcome the difficulties connected with anomalous formation pressures and temperatures and with the effect of aggressive brine water. The buildup of facilities and the operation of newly discovered deeplying fields require that the specialists solve a major set of technical and operating problems.

Drilling workers are also getting ready to master great depths under difficult conditions, since the proper experience still does not exist. The slogan of the Starogroznskiy drillers, "For 5,000 meters of penetration per year per drill rig, and for a reduction of the full cycle of construction of superdeep wells to 1.5 years," was remarkable in this regard. Tens of drilling brigades have joined in the competition of the "five-thousanders."

Today the prospects of reaching the Lower Jurassic subsalt sediments has become an urgent necessity. Several holes up to 6,500 meters deep have been laid down at Malgobek. Experienced oil-exploration foremen M. Khadziyev and I. Galayev are now drilling. Exploration is continuing also in the Upper Cretaceous, whose resources, in the specialists' opinion, are still far from exhausted.

In solving long-term technical tasks, oilfield workers do not forget about the old wells, the more so since even today they make up the association's basic inventory. The recovery factor for the Karagan-Chokrak sediments does not exceed 30-40 percent, that is, more than half of the oil reserves are still in the formation. The oilfield workers must use this enormous reserve to the maximum. The association has contemplated two directions: the use of physico-chemical stimulation at the bottom-hole zone for increasing productivity, and the use of new methods that call for the introduction of more active stimulation at old deposits.

The workers at the oilfield facilities have, with the scientists' help, achieved certain positive results in this area. Of the new processes, the method of stimulating depleted formations with superheated steam is being tried, and work on preparations for creating a moving in-situ combustion front is being completed.

Major preparatory work is being conducted to support the operation of hydrogen sulfide-containing oil and gas deposits, the scale of automation of production processes is being expanded, and ASU's [automated control systems] are being created for various areas. Prior to the end of the five-year plan, four oilfields with gusher recovery will be automated in integrated fashion, and, by the end of the five-year plan, the level of recovery with integrated automation will be brought up to 92 percent.

The Goryachevodskoye UBR [Drilling Administration] has been specified as the Min-nefteprom [Ministry of Petroleum Industry] base for working out an ASU system for drilling, and this system is now being tested here.

The oil industry of the autonomous republic has at all stages of its development exerted a considerable influence on Checheno-Ingushetia's economy and culture, helping it to blossom still more. During preceding five-year plans, new well-appointed cities and workers' settlements--Malgobek, Goragorsk, Karabulak, Novogroznyy and Pravoberezhnoye--at which cultural centers and domestic-services complexes, among which are 18 clubs, 28 children's institutions, stadiums, dispensaries, recreation areas--have risen up, and housing and new cultural and domestic-services facilities are being built. Oilfield workers have done much to improve the republic's road net.

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USSR'S OIL INDUSTRY COLLABORATES WITH CEMA COUNTRIES

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, 1982 pp 60-63

[Article by D. A. Takoyev, deputy minister of Oil Industry: "The Collaboration of the Socialist Countries' Oilfield Workers"]

[Text] The CPSU Central Committee decree, "On the 60th Anniversary of the Forming of the Union of Soviet Socialist Republics," noted with the greatest completeness the relationships among states that are inherent in the nature of socialism and are embodied in socialist collaboration. Collaboration within the framework of the Council of Economic Mutual Assistance and the Warsaw Pact Organization enables the social and national interests of the socialist states to be combined correctly, and to be moved forward confidently for each country and for the whole socialist collaboration. The fraternal countries are constantly developing and deepening collaboration, and this is apparent, in particular, in the example of the many years of economic, scientific and technical ties of the socialist countries' oilfield workers.

The time that has elapsed since the start of fulfillment of the long-term Integrated Program for Further Intensifying and Improving the Collaboration and Development of Socialist Economic Integration, which was adopted at the 25th CEMA Session in July 1971, has confirmed the correctness of the policy chosen. The total national income of CEMA member countries for 1971-1980 rose by 66 percent and industrial production volume increased by 84 percent, which is about double the similar indicator for the developed capitalist states. The CEMA countries surpass the Common Market states and the USA taken together in many important industrial indicators, including those for oil recovery, which increased 1.6-fold in 10 years and exceeded 617 million tons, including gas condensate, in 1980.

The scale of economic and scientific and technical collaboration of the fraternal countries is great. Their mutual commodity turnover for 1971-1982 increased 3.7-fold, reaching 134 billion rubles. About 3,000 scientific-research and design-development organizations and vuzes are participating in the scientific and technical collaboration of the CEMA member countries. During the first decade of implementation of the Integrated Program, they completed more than 16,000 joint theoretical and applied works. The economic benefit obtained by CEMA member countries from use of the results of the collaboration exceeds 5 billion rubles.

In the oil-industry area the Integrated Program calls for the development of CEMA member country collaboration aimed at raising the level of members' own oil and gas recovery, participation in the development of oil-recovery capacity on the USSR's

territory, and a joining of the efforts of scientists and production workers in searches for new technical solutions for accelerating scientific and technical progress in this area.

The Standing CEMA Commission on Collaboration in the Field of the Oil and Gas Industry is doing much work in the indicated directions. This includes standing working organs for oil and gas geology, geophysics and drilling, the recovery and transport of oil and gas, and the treatment of crude. Moreover, a standing working group on standardization and the Informneftegaz [International Industrial System for Scientific and Technical Information on the Oil and Gas Industry] system have been created under it. The commission promotes realization of the agreements that have been concluded and participates in collaboration on interindustry problems.

New and important tasks face the Standing Commission and the corresponding ministries and agencies of the collaborating socialist countries in connection with CEMA's adoption in 1978 of a long-term specific-purpose program for collaboration (DTsPS) in the area of energy, fuel and raw materials. Soviet organizations have a leading role here. The Soviet Union supplies, in particular, the basic import requirements for fuel and power resources of the CEMA member countries.

During the current five-year plan the USSR will provide for the delivery of oil, gas and other types of energy resources, and also raw materials and other materials to the fraternal countries at prices considerably below world prices.

The USSR constantly extends much assistance in creating oil and gas industries in the socialist countries. In their turn, in accordance with the Integrated Program, they help to develop the Soviet Union's oil industry. The socialist-collaboration countries participate, for example, in creating on USSR territory additional capacity for recovering and transporting oil and gas. Erection of the Polotsk-Birzhay-Mazheykyay oil pipeline is being completed with the help of Polish specialists. The Hungarian People's Republic sends to the USSR complete sets of operating equipment for domestic oil machinebuilding and automation systems for recovering and transporting oil, the Czechoslovak Socialist Republic sends equipment for outfitting-module pump stations and Tatra trucks, and the GDR sends installations for treating crude and for drying casing-head gas.

The scientific collaboration of Minnefteprom [Ministry of Petroleum Industry] with the appropriate CEMA member-country organizations covers all the main areas of the industry's activity. Along with long-term collaboration in the traditional forms, that is, those based upon intergovernment and interagency agreements and bilateral understandings about direct scientific and technical collaboration, multilateral agreements are playing a growing role. In 1981 Minnefteprom participated in the execution of 15 intergovernment and interagency agreements, contracts and understands about collaboration with socialist countries, and it also was represented on 8 working groups, 6 of which involved multilateral collaboration.

Multilateral agreements are a comparatively new area, which has already proved its high effectiveness. The agreements in which Minnefteprom participates were concluded mainly in 1974 and 1975. They call for a rather extensive program of joint research. Within the framework of the agreement, "On the Coordination of Prospecting and Geological Exploration in Like-Named Geological Regions," production organizations of the GDR, PRL [Polish People's Republic], USSR and CSSR [Czechoslovak Socialist Republic] have done geological research in three contiguous regions.

As a result, consolidated geological and geophysical profiles and maps were constructed, prospects of the petroliferousness of border zones were assessed, optimal conditions for geophysical operations and for laying down deep wells were selected, and the technology for sinking wells and for delineating formations and methods for intensifying influxes from them were improved. The joint work permitted the number of deep wells previously slated for drilling to be reduced.

As a result of collaboration on this problem, expenditures for studying the presence of gas and oil in the adjoining regions was reduced by about 40 million rubles without detriment to the quality of the research, and evaluation of the promise of the presence of gas and oil in each of the countries was speeded up.

Scientific and technical collaboration on the problem, "The Creation of Methods and Technical Means for the Automated Processing and Storage of Oilfield-Facility and Geophysical Field Data," has been accomplished since 1973. The Coordinating Center, whose function it is, in accordance with agreement of the parties concerned, to carry out Minnefteprom's Central Geophysical Expedition, was organized in August 1974. Since 1976 the work has been done with the participation of the BNR [People's Republic of Bulgaria], MNK [Hungarian People's Republic], GDR, PRL, USSR and CSSR.

The program of joint research and development included 36 titles, 6 of which were completed during 1977-1979, 6 in 1980.

Multilateral contracts that use the principle of equality of expenditures of the parties has become the form of collaboration most advantageous mutually. During 1975-1980, the effectiveness of scientific and technical collaboration on seven titles increased primarily through a rise in the responsibility of the parties. The total economic benefit for all countries that was obtained in accordance with the indicated contracts reached 7.5 million transferable rubles by 1981, at a total cost of contract work of 2.8 transferable rubles.

Following are the main developments that are of great importance for the oil industry's geophysical service.

1. The creation of a system of control programs and a library of geophysical programs for processing seismic-exploration data on the YeS-1040 and YeS-1505 computers in a collaboration of geophysicists of the GDR, USSR and CSSR. In its characteristics and technological potential, this system (the STsS-3) is on a par with world systems. The economic benefit from introducing it in Minnefteprom production organizations has been significant.

2. The creation of the first phase of a system for the automated processing of data on field geophysical data on oilfields on a computer, with the participation of geophysical enterprises of the BNR, MNK, USSR and CSSR. The programs of this systems complex are being widely introduced by various production organizations.

The scale of interactions of the socialist collaboration countries in the area of deep drilling and of superdeep wells is being enlarged. In 1974 the BNR, MNK, GDR, PRL, RSR [Socialist Republic of Romania], and the USSR concluded a multilateral agreement on the problem, "The Creation of Systems for Optimizing Drilling Processes with the Use of Computers for Drilling Deep and Superdeep Holes." In 1975-1980 the work was done under six titles. As a result, mathematical models, algorithms and programs were created for calculating on a computer various technological operations for constructing wells, as well as technical means for monitoring the

technological process of drilling and the system for collecting and processing information at the drill rig. The requirement for casing string was computed for 1979-1980 for certain Minnefteprom associations. A great economic benefit was obtained from introducing the computational methodology.

Countries participating in the agreement for conducting special explosive-perforation oilfield geology work in deep and superdeep holes (the BNR, MNK, GDR, PRL, USSR and CSSR) have undertaken to develop oilfield geophysical apparatus on the basis of contracts. In 1981 six contracts with a value of 1.8 million rubles were concluded. Their fulfillment will help in the most rapid creation of apparatus for monitoring the development of fields and for recovering cores.

All European CEMA member nations have taken part in joint work on the problem of developing new equipment and improving existing equipment and technology for casing wells, as well as for isolating and testing formations at great depths.

In June 1980 the Joint Laboratory for Drilling and Plugging Solutions, in the creation of which BNR, MNK, GDR, PRL, RSR, USSR and CSSR organizations participated, began operation in the RSR under the Romanian Scientific-Research and Design Institute for Oil and Gas at Kympin. Among the questions being treated by the laboratory is a scientific and technical forecast up to the year 2000 on the improvement of muds that are used in drilling oil and gas wells.

In the 1970's and the beginning of the 1980's, the coordination of scientific and technical studies continued on topics connected with increasing the recovery of oil and gas in CEMA member countries. Studied in particular were questions of the improvement of existing geological, geochemical and geophysical methods and the creation of new ones for prospecting for and exploring various types of fields and deposits of oil and gas, a methodology for assessing oil and gas reserves (the prime organization was Minnefteprom's IGIRGI [Institute of Geology and the Development of Useful Minerals]), and the collaborators were organizations of the BNR, MNK, GDR, PRL and CSSR). Research carried out during 1975-1980 enabled the more promising areas that are associated with lithological lensing-out zones and stratigraphic nonconformities, and also combinations of them, to be identified.

Within Europe's socialist countries, within the oil and gas regions that have been studied, about 100 oil and gas fields and deposits had been known, which were confined to nonanticlinal traps. In all, in CEMA member countries, in 1976-1980, more than 200 oil and gas fields were discovered that will support an increase in hydrocarbons of industrial categories. Prospecting and exploration for oil and gas is being performed on the Baltic Sea shelf within the framework of a trilateral agreement, "Petrobalt," which was signed at the end of 1975 by the GDR, USSR and PRL. Geophysical methods have shown promising oil and gas structures. The drilling of exploratory wells has already confirmed the petroliferousness of two structures, and a gas-condensate field was discovered at a third.

Scientific and technical collaboration within the field of oil and gas geology and geophysics has been raised to a higher level with the conclusion in May 1981, within the framework of the Standing CEMA Commission on Geology and on the Oil and Gas Industry, of appropriate multilateral agreements. Research has begun on further improvement of methods for exploring for and estimating oil and gas reserves at great depths for the various geological conditions of the participating countries.

In 1975, at the decision of the CEMA Standing Commission on Oil and Gas Industry, an international industry system of scientific and technical information, Informneftegaz, was created, which is a combining of the national scientific and technical informations systems of the BNR, MNK, GDR, Cuba, PRL, RSR, USSR and CSSR. The prime organ of the international system is Minnefteprom's VNIIOENG [All-Union Scientific-Research Institute for Organization of the Management and Economics of the Oil and Gas Industry]. Exchange of information, both by traditional methods and by use of automated systems, is arranged within the framework of the Informneftegaz system.

With a view to realizing measures for the Long-Term Specific-Purpose Program of Collaboration in the Field of Energy, Fuel and Raw Materials within the framework of the CEMA Standing Commission, agreements were signed about scientific and technical collaboration on the problems, "Improvement of the Technology for Developing Oil and Gas Fields and the Search for More Effective Methods and of Technical Means for Increasing Withdrawal from the Formations," and "Increase in the Operating Reliability and Efficiency of Trunk Oil Pipeline Systems."

Work on increasing withdrawal (the prime organization is Minnefteprom's VNII [All-Union Oil and Gas Scientific-Research Institute], and the collaborators are organizations of the BNR, MNK, GDR, PRL, RSR and CSSR) has been aimed at raising the effectiveness of the development of oilfields. In the MNK, technical and economic justification for industrial tests of micellar solutions has been developed, the USSR has determined the prospect for using petroleum sulfonates for preparing the micellar solutions, cyclic and selective waterflooding of inhomogenous formations has been tested, the USSR and MNK have evaluated the effectiveness of displacing oil by means of injecting carbonic acid, and so on.

The use of wet in-situ combustion at the Shtevanov and Menin fields in the CSSR has raised oil withdrawal from 12.2 percent to 51.1 percent. This same method has been used successfully at the Khorosany field in the USSR, and recovery at a test section here rose 2.5-fold. VNII has worked out a methodology for interpreting hydrodynamic research of formations and of wells, which is used in various geological conditions in the BNR and PRL.

The BNR, MNK and USSR have performed industrial tests on restricting the influx of brine water with hydrophobic microemulsions. The additional oil recovery at Tatneft' [Tatar Oil Production Association] since its introduction in 1973 has been assessed at 120,000 tons, where there is a restriction of about 1 million tons of water that is extracted in passing.

Collaboration in the area of pipeline transport is aimed at improving the technology and technical means for overhauling trunk oil pipelines, creating means for protecting them from corrosion and developing efficient methods and technical means for eliminating breakdowns.

Minnefteprom is participating in bilateral scientific and technical collaboration with the appropriate agencies of CEMA member countries. Thus, an agreement about collaboration in the field of developing means and systems for automation and remote control for the oil and gas industry that was concluded with the MNK in 1977 is being implemented successfully.

Much work is also being done within the framework of bilateral understandings about direct collaboration. The fact that research was conducted in 1981 on 35 topics, which embrace almost the whole area of the oil industry, gives a notion of its

scale. The economic benefit from introducing into the USSR's petroleum industry the results of bilateral collaboration with socialist countries and from reducing the time required for scientific research was 7.4 million rubles in 1981 alone. Bilateral collaboration will be developed further during this five-year plan.

Collaboration with the Soviet Union has special significance for such CEMA participants as the DRV [Democratic Republic of Vietnam] and Cuba, which began comparatively recently to develop their oil and gas industries.

The CPSU Central Committee's report to the 26th Party Congress noted, "The CPSU and other fraternal parties are taking the route of transforming two forthcoming five-year plans into a period of intensive production and scientific and technical cooperation of the countries of socialism." In so doing, an important place is assigned to collaborating with and to providing CEMA member countries with fuel and power resources, including petroleum. In order to solve the tasks in this area successfully, forces and resources must be combined and joined more rationally in the interests of each country and of the entire socialist collaboration.

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PAST, FUTURE PROGRESS OF OIL-PIPELINE TRANSPORT DESCRIBED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Jan 82 pp 72-74

[Article by V. D. Chernyayev, chief of Glavtransneft' [Main Administration for the Transport and Delivery of Crude Oil]: "The Country's Oil Pipeline Transport on the 60th Anniversary of the Soviet Government"]

[Text] During the 60 years of the existence of the Union of Soviet Socialist Republics, the country has created a mighty oil industry and modern highly developed pipeline transport for oil, petroleum product and gas. The main oil-delivery region in prerevolutionary Russia was the Baku region. The oil refineries also were located here. Petroleum product from Baku was exported mainly by waterways: along the Caspian Sea, the Volga and its tributaries, and, beyond, along the Mariinsk waterways, with exit on the Neva. Bulk transshipment plants were erected along this route, which supplied petroleum product to a great part of the country. The oil pipelines that were built in those years in the Baku, Groznyy and Maykop regions were of local significance. By 1917 their total length was 1,357 kilometers.

The country's oil-transport activity began to be developed after nationalization of the oil industry in 1918. Change in the geography of oil recovery and the development of newly discovered fields in the upper and middle Volga areas necessitated new trunk oil pipelines. Thus, from 1928 through 1932, about 1,900 kilometers of oil pipelines were built, and, during the next five-year plan, 1,150 kilometers more. By the end of 1945 the total length of the trunk oil and product pipelines operating in the USSR was 4,400 kilometers.

Since then, the technology of erecting trunk oil pipelines began to be essentially improved, and the necessity for strict specialization of construction organizations and the creation of special equipment appeared.

During the first two postwar five-year plans about 7,000 kilometers of oil pipeline were built, and the total length exceeded 11,000 kilometers by the end of 1955. Subsequent development of oil recovery at new fields required the construction of oil pipelines of great capacity for the large-scale pumping of crude over great distances. It was necessary to overcome the many technical difficulties that were connected with the lack of pipe more than 500 mm in diameter and the appropriate pumping and auxiliary equipment.

Thanks to the measures taken by party and government and the help of interrelated cooperating branches of industry and the selfless labor of workers, engineers and

technicians of design and construction organizations, the network of trunk oil pipelines continued to grow, reaching 18,000 kilometers by 1960.

However, oil-pipeline transport began to be developed more intensively in the Soviet Union in the next two decades, based upon plans for locating facilities for oil refining that would take account of the actual prospects for developing oil recovery.

During this period the length of trunk pipelines increased 4.5-fold over 1960's, and the amount of oil transported over them and the freight turnover increased, respectively, 5-fold and almost 30-fold. During the 10th Five-Year Plan about 11,000 kilometers of trunk pipeline were built and put into operation, half of it being laid over new routes. As a result, the share of oil-pipeline transport and of freight turnover of oil within the system of the traditional types of transport (rail, water, sea, river and automotive) increased, respectively, 1.3-fold and 2.4-fold.

At present 95 percent of the oil recovered in the USSR is sent to customers over oil pipelines. This has enabled the more heavily loaded railroads to be freed to a great extent from hauling oil and to be used for hauling other freight of the national economy.

The great scale of oil-pipeline transport development in the USSR is being supported by the appropriate capital investment. While capital investment in oil-pipeline transport was 4.6 billion rubles in the first 15 years after 1960, during the 10th Five-Year Plan it reached about 3.4 billion rubles.

The necessity for an increase in capital investment in oil-pipeline transport was caused not just by growth in actual volume of oil pipeline construction but also by the more complex natural conditions of the areas of construction, and also by the use of large-diameter pipe made from steel with improved mechanical properties. Taking these factors into account, oil-pipeline construction is 2.5-fold to 3-fold more costly in the northeastern regions than in the European part of the USSR.

Growth in the amounts of oil pumping, the freight turnover and capital investment in trunk oil-pipeline construction testifies convincingly to the growing role of oil-pipeline transport in the country's economy. Its importance is especially great in the transport of oil from fields of the northwest Siberian region, which lacks a widely developed network of railroads and trunk highways, as well as the water-transport arteries that connect these fields with oil consumers in the country's inhabited regions. Pipeline transport from the new oil-recovery regions is more economical and more improved than the traditional forms of transport. Its prime operating cost is one-half to one-third that of hauling by rail. The growing recovery of oil in Siberia's northwestern regions and the necessity for transporting it to consuming regions that are 1,500-2,000 kilometers away makes oil-pipeline transport irreplaceable. The average distance for transporting oil over pipelines was more than 2,000 kilometers in 1981, while for some pipelines it exceeded 3,000 kilometers.

With growth in recovery and increase in the capacity of the streams of oil that are taking shape in the appropriate directions, the network of trunk oil pipelines has been expanded in the last decade by the use of 1,220-mm pipe, while the share of pipeline 1,020 and 1,220 mm in diameter is now more than 30 percent.

In comparison with oil pipelines less than 530 mm in diameter, the prime operating cost for pumping oil along large-diameter pipelines (630-1,220 mm) has been reduced by 28-57 percent, specific metal consumption by 33-58 percent, and specific capital investment by 22-70 percent.

The rising throughput of the oil pipelines has enabled large flows of crude oil to be formed in the required directions, the recoupment of capital investment in construction to be speeded up, and, finally, the technical level of oil-pipeline transport to be raised.

Accelerated pump-station construction is provided for by introducing the outfitted-module method of erection, using special box modules that are supplied by domestic plants and the CSSR [Czechoslovak Socialist Republic].

The pump stations of the trunk pipelines are equipped with special centrifugal pumps, in accordance with GOST [All-Union State Standard] 12124-74, which enable the delivery of from 125 to 12,500 cubic meters per hour. They are designed to operate with an efficiency of 68 to 89 percent. The pump drive includes special small, highly effective synchronous-type electric motors with a nominal power of 1,250-8,000 kW and an rpm of 3,000. Such pump units support the "from pump to pump" operating scheme, which enables operation without the use of expensive tank farms at intermediate pump stations. This operating technology for pump stations greatly reduces metal consumption for the construction of tanks and precludes losses of light fraction of crude from them, which rises sharply in the summer.

The tank farms at terminal and intermediate pump stations that are located at the boundary of adjacent operating sections have steel reservoirs with a capacity of 20,000 and 50,000 cubic meters each and are assembled from prefabricated roll material that comes from the factory. Mechanization of the assembly and automation of the welding of the tanks greatly reduce assembly work and construction time.

On the most important routes, the use of tanks for accounting for the crude that is being pumped along the line is now replaced by modern means of measuring the oil--special turbine-type flowmeters. By 1982, 166 assemblies for accounting for oil had been introduced on oil pipelines.

Average electric power per pump station increased during the 10th Five-Year Plan by 37 percent, and it now is 12,200 kW. The pump-station and line structures that were built in the last two decades are equipped with automation and remote-control equipment, so they can be controlled from local and central control centers. The use of this equipment enables the controller to monitor the status and the normal operation of the pump stations and to adopt decisions responsively in the elimination of observed malfunctions and in the maintenance of optimal pumping regimes on the pipeline.

In accordance with 26th CPSU Congress decisions, Glavtransneft' has planned a set of organizational and technical measures for increasing the effectiveness and reliability of oil-pipeline transport operations, for the realization of which execution of the following is called for:

increase the strength characteristics of the metal in the pipe used in building oil trunk pipelines, thereby simultaneously reducing the thickness of their walls;

improve the quality of wedge gate valves that are used for large-diameter oil pipelines and provide for the operating reliability thereof at temperatures below -40 degrees C, after providing protection of the electric drive from atmospheric precipitation;

increase the operating pressure and operating efficiency of oil pumping and expand the adjustment range of trunk pipeline centrifugal pumps;

extend the service life of means for the electrochemical protection of pipelines by creating and introducing durable anodic grounding and wider monitoring over the operation of cathodic protection facilities by remote-control equipment;

continue to further introduce into practice current accounting for the oil being pumped, by special meters instead of recording it by tank measurements;

organize research for discovering the suitability of turbine-type meters for the commercial recording of oil being transported over the pipelines;

expand the introduction of modern technical means for remote control and for ASU [automated control systems] into trunk-pipeline management;

raise the technical level of repair work on oil trunk pipelines by further introducing a centralized system for servicing and repair, organizing bases for production servicing, and using the more effective insulating material Plastobit 2M; and

expand research in the area of increasing the operating effectiveness and reliability of pump units (improvement of suction capabilities where the crude is gas-saturated, a rise in operating efficiency, the use of effective methods and ways for regulating pump operation and for technical diagnostics, and so on).

The contemplated measures embrace questions of saving fuel, power, and material, technical, financial and labor resources and of reducing losses during crude-oil pumping.

The successes achieved by the pipeline transport of oil in the 60 years of the Soviet Government's existence are the result of the purposeful and great work of a collective of thousands of blue- and white-collar workers, engineers, technicians and scientific workers. Further growth in the country's oil-pipeline transport will depend upon improvement of the technical and operational solutions that are associated with the specifics of the regions of construction, and also upon a rise in the technical level and the quality of servicing and of materials.

This task now faces the workers of oil-pipeline transport and of the industry's scientific-research and design institutes.

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GENERAL

SOCIALIST COOPERATION IN ELECTRICAL ENGINEERING INDUSTRY DESCRIBED

Yerevan KOMMUNIST in Russian 3 Sep 82 p 3

[Article "Deeds and Plans of 'Interelektro'"]

[Text] The international organization "Interelektro," which includes People's Republic of Bulgaria, Hungarian People's Republic, GDR, Polish People's Republic, Socialist Republic of Romania, USSR, CSSR and Socialist Federated Republic of Yugoslavia, was formed 9 years ago. The deputy minister of the electrical engineering industry of the USSR, Leonid Safronkov acquaints us with its activity.

The creation of "Interelektro" resulted in multifaceted cooperation in the electrical engineering industry, reduction in the period for solving scientific-technical and economic problems, improvement in quality and the depth of working out the problems.

The international specialization and cooperation of production of electrical engineering products was considerably developed during the years. In 1976-1980, "Interelektro" signed 11 agreements on international specialization and cooperation of production, encompassing 350 types of electrical engineering items: turbogenerators, hydrogenerators, large electrical machines, power transformers, high-voltage and low-voltage equipment, electric engines, cable and light-engineering items, insulators, semiconductor instruments, transformers and special production equipment.

Realization of these agreements made it possible to increase the series production of specialized products, reduced outlays for its manufacture, and raise labor productivity. In 1981-1985, specialization and cooperation of production of the electrical engineering products within the "Interelektro" will be further developed; 12 agreements will be realized, the total turnover during these years will rise 2.9-fold, as compared to the previous five-year plan there will be a significant expansion in cooperation based on unified assemblies and elements, and there will be a doubling of the nomenclature of specialized products.

Scientific-technical cooperation in the framework of "Interelektro" is closely associated with economic cooperation and has an all-encompassing nature. It stipulates both the conducting of scientific-research and experimental-design work, and the development in series production of newly created items, their standardization, development of suggestions for specialization

and cooperation of industry. In 1977, 20 agreements were signed on multi-lateral cooperation, in whose realization over 150 scientific research organizations and production associations of the participating countries in "Interelektro" participated.

The high degree of unification of parameters and dimensions makes it possible to use the main design to develop different modifications of engines with short-circuit and phase rotors.

The specialists of the socialist countries have created 150 types of modern instruments which are distinguished by improved weight and overall dimension indicators, increased efficiency, reliability, lengthened service life and yield significant conservation of silicon, tungsten, copper and nonferrous metals. In the Soviet Union, Romania and Czechoslovakia, series production of these instruments has begun. It will provide for the needs of all the interested participating countries.

Work to create unified series of low-voltage asynchronous electric engines included over 80 topics. Designing and development of electric engines in production was done in two directions: the series of electric engines of general industrial use and the series of explosion-protected electric engines. Their introduction into the national economy will make it possible to significantly reduce the consumption of materials, and decrease labor intensity.

The coordinated development of production facilities is one of the effective forms of international cooperation. Examples of this cooperation are the construction in the USSR with the participation of the GDR and Polish People's Republic of the Novovolynskiy plant for producing special production equipment and building enterprises for the manufacturer of electric engines in cities of Uzhgorod (USSR) and Mogelnitsa and Mikhalovets (CSSR), reconstruction of the national electric machine enterprise "Zaksenverk" in Dresden (GDR).

A brilliant example of the development of bilateral cooperation of the participating countries of "Interelektro" has become the creation by the collectives of VNIIEO [All-Union Scientific Research Institute for electro-thermal equipment] (USSR) and Klev (GDR) and subsequent development and manufacture of electron-radiant furnace with holding capacity of 30 tons for smelting high-quality steels. In 1982-1990, within the framework of "Interelektro" work will be continued for further development of international cooperation. Its goal is to increase scientific-technical and industrial potential of the electrical engineering industry. Measures will subsequently be implemented aimed at realizing long-term programs for cooperation in the area of power engineering, fuel-raw material sectors, machine construction and agriculture.

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GENERAL

INTERDEPARTMENTAL CONFUSION DEVELOPS AT NERYUNGRI GRES

Moscow STROITEL'NAYA GAZETA in Russian 12 Sep 82 p 2

[Article by V. Antonov, special correspondent "1. Around Neryungri"]

[Text] There is no mineral in the world that is not found here. On the contrary, there are those which you will not find any other place. For example, hard coal which ignites from a match, and the heat of its flame cannot be withstood by any metal furnace. Nature itself has surrounded with Lenskiy columns a territory which is now defined as the South Yakutsk territorial-production complex.

"Our kray is harsh, the average annual temperature is considerably below zero," the first secretary of the party gorkom I. P'yankov related at the all-union journalist short meeting. "But because of what is hidden underground, people are coming here and living here for a long time. However, some things lie on the surface -- like, for example hard coal. In this depression (we were standing on the edge of an open-pit quarry) only four square kilometers across, 500 million tons of coking coal are concentrated. We have a total of 45 billion tons of it in our region and 7.5 million tons of iron ore. For comparison: the reserves of Magnitka are 2.5 billion tons."

Because of this wealth, the country does not spare anything for this region. It is precisely here that construction of the small BAM (Baykal-Amur Trunkline) railroad was first completed. Here the main examples of the 180-ton coal carriers and dump trucks, 20-cubic domestic and foreign excavators are operating.

A concentrating plant is under construction whose metal frameworks have already been raised. A large-panel plant for house construction is in operation; a city is growing where there are 3-meter ceilings in the houses, and the schools and kindergartens mandatorily have swimming pools.

Then it will be the turn of the tire plant, metallurgical combine, new quarries and mines, a cascade of GRES's based on inexpensive local coals, enterprises of the construction industry and much more which will enter the system of the county's largest production complex, the first-born of the Baykal-Amur-Trunkline.

But this is in the future. Now the Neryungri GRES is the start-up facility of the second half of 1983. The obligation to finish it 6 months ahead of schedule has been adopted.

An immense mass of coal waits for the new GRES. Annually, there will be four million tons of the upper, oxidized layer alone, which is not suitable for coking. However, it is an excellent fuel base precisely for the cascade of power plants. The first plant is nearing completion. How are operations at the construction site: I would like to focus attention on this in the first letter.

"First of all, we should speak about the poor quality of the project made by the Novosibirsk division of the Teploproyekt institute," states G. Druzhinin, chief engineer of the board of the GRES under construction, as he led the tour of the facility.

We are going along the ridge between the channel which supply and remove water, one of which will feed cold water, and the other release heated water into the lake. Workers with expertise are afraid that the necessary cooling will not occur. It is visible to the naked eye that the connecting piece between the channels is thin and the ground is loose. This means that filtering and mixing of the cold and hot water is inevitable. The design of the water intake is faulty. The 35-person brigade installed only the grids in 3 shifts. A total of R 200,000 was paid in wages. The material, wood, was however inexpensive. It seems that in the long run metal grids would have been cheaper.

"The designers have a certain justification for we still cannot finance them to completion, since our resources have been drastically reduced," G. Druzhinin objectively approaches the problem. "The USSR Ministry of Power and Electrification still provides R 40 million, a third of the necessary sum. When we don't pay the designers, they naturally don't provide documents, and without the drafts, we cannot even defend our claims for funds and for housing for the GRES."

It is clear that there is no possibility to break the vicious circle locally, in Neryungri. It is obvious that this can only be done in Moscow, in the ministry.

On its part, everything possible is being done in Neryungri to accelerate construction of the GRES. The party gorkom has equipped a representative delegation to conclude negotiations with all the participants building the power plant, for the competition based on the principles of the worker relay race. There are already results. Foundation parts for turbines have been made ahead of schedule. The turbine has also been assembled ahead of schedule by the Komsomols from the association "Leningradstiy metallicheskiy zavod." It arrived safely in Neryungri back in May.

It is true that a certain misunderstanding developed here, of which it is not easy to speak, but it is impossible to be silent. The turbine arrived, but without the 30 completing assemblies and parts, and without technical documents. The Komsomols are hardly guilty in this case. Therefore a rapid telegram was sent not to them, but to the administration of the association of Neryungri. Not the Komsomol committee, but the department of marketing and the association bookkeeping office received money for the incomplete turbine.

Nevertheless this is a single case. Everyone in some way or another strives to help such an important facility as the South Yakutsk TPK. Only the Ministry of Power and Electrification is not hurrying to finally finance its facility which places it in an even more difficult position. Why? In order to explain this, I go to the main planning-economic administration of the USSR Ministry of Power and Electrification which is closest of all to the ministry money.

"We do not have enough resources, it is necessary to cut back, so we removed some facilities from the start-up for 1983, including the Neryungri GRES," notes the head of the department of energy construction of the main planning-economic administration Ye. Popova.

Everything is most clear. As they say, there is no justice, and someone must be the last. The fact that precisely Neryungri GRES has been moved to the tail, apparently was discussed many times with all interested parties before it was suggested. Is this not so?

Suddenly the chief specialist of the planning-economic administration (its previous main worker, the recipient of a special pension, who continues to work) E. Iokhvidov added:

"The fact is not even that there is not enough. No matter what happens we always find resources for the start-up facility. We see that the main point is that they still do not start up on time. Why should we then throw money to a place where they will produce an output later than in other places?"

Well! How can this be? In Moscow they perceive that in Neryungri they won't be able to manage, and locally in Neryungri, they are preparing to complete a facility six months ahead of schedule. You must agree that this is a very strange contradiction.

Therefore the next visit was to the customer of the Neryungri GRES -- the Main Administration for the North East Power and Electrification of the Ministry.

"Ivan Nikolayevich what moved you to agree to transfer the start-up of the first block to 1984?" I asked the head of the central board I. Kravchenko.

"I agreed? I myself only found out after the fact. This should not have been allowed in any case. We are holding the industrial centers of the Far East on a hunger energy ration. On the contrary, it is necessary to plan and build as fast as possible the second phase of the GRES in Neryungri. No, I will fight!"

I was the first to bring the news to the chief engineer of the general contracting subdivision, the Glavenergopromkomplekstroy A. Shachkov that the main planning-economic administration planned to move the Neryungri GRES to 1984. Moreover, Anatoliy Ivanovich clearly refused to believe me:

"What are you saying? You cannot have thought up anything more ridiculous!" He cried hotly, but having calmed down, he began to prove to me: "We do not have a facility that is more ready for completion. Look: its readiness is several times higher than similar facilities in other regions of the country. The main framework, the dam, the fuel-supply, the chemical-purification, all is developed. The foundation for the boiler has been finished,

and the boiler itself is coming, equipment is operating at full speed, and we are finishing installation on time. By the way, do you know that the turbine has arrived? If the facility freezes and the turbine goes into winter, it will stop. For there is nowhere to store it in Neryungri. No, something here is not right."

I could not help but agree with my companion. Moreover, in this story there is not "something," but a lot of "not right." This is mainly the lack of agreement in the actions of the administrations of the USSR Ministry of Power and Electrification itself.

The planners should talk things over with their central boards. (By the way, I called the Yakutsk party obkom, and it was not even informed). Everything was decided by the main planning-administration itself, not only the leadership of the ministry, but even the department of power engineering of the USSR Gosplan was convinced of this. Documents were sent for approval.

It is to be hoped that they will be returned.

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GENERAL

OPEN MEETING FINDS ANSWERS TO BALAKOVO AES PROBLEMS

Moscow SOVETSKAYA ROSSIYA in Russian 17 Sep 82 pp 1, 2

[Article by G. Orlovskiy and A. Chernenko, special correspondents:
"A City's One Hundred and Forty Questions"]

[Text] The envelopes have been opened. Now follow the answers of the competent leaders to the questions, suggestions, and claims of the citizens. We are making our report. Only we would like to begin it with a question. What is the secret of the increased popularity of the "Day of the Open Letter"? We stress, open.

When a person appeals to a certain institution with a letter, its examination nevertheless presupposes a certain intimacy: the author and the leader one on one. Many appeals certainly need this kind of situation. But the majority of letters have in them a charge of public interest. Their authors too expect and desire the broad publicity of an examination. The "Day of the Open Letter" it seems completely corresponds to this attempt. Yet another form of social communication has been born which makes it possible to more completely manifest the simple activity of man.

Drawing a Portrait of the City

Balakovo is very similar to its brothers Bratsk, Naberezhnyye Chelny, and Chaykovskiy, cities which rapidly grew, with difficulty and eagerness. In 25 years the population of Balakov increased 7-fold! But it is also unique: for a quarter of a century the city has labored at four all-union shock worker construction sites, and now has started a fifth, a nuclear power plant! Here, next to the Saratov GES imeni Leninskiy Komsomol, the Balakovo AES is rising, and the city is becoming a unique energy center of the region.

But growth does not occur without difficulties. The swift development of the Volga city generated many problems, both production and social. Were the city and those organizations which have called upon to guarantee achievement of economic and social goals capable of solving many problems even now? We will listen to the people from Balakovo.

Give Us a Support Platform!

From the letter of the brigade foreman of the administration "Saratovgesstroy", Hero of Socialist Labor Nikolay Derkach: "Our brigade is installing the heart of the nuclear power plant, the reactor shop. There was a time when we worked on a 'zero' plane, and we had 3 shifts of people working. Now it is a rarity to have 2. There are several reasons. Here, the internal reserves are poorly used and there were complications with the cadres. Basically new, enlarged brigades came to work. It was good work and it should have been mandatory to work in harmony. But, as they say, you do not build a furnace without bricks. Our 'good reforms' slipped because of interruptions in supply. Here is an example: the delay only for supplies of rolled metal products for construction of the Balakov AES is over 4,000 tons. Who is responsible? It is difficult for me to discuss ministerial, inter-departmental lack of coordination. We needed metal, since without it the work slows down. Give us a working support platform made of those metal designs which we did not receive, and we will exceed the assigned construction targets".

Representatives of the union and republic ministries and departments were invited to the "Day of the Open Letter." The majority of them came with their "staff" made up of leaders of different services. The purpose of such a powerful "landing party" to the construction site of the five-year plan shock project was not merely an able response to a specific letter. It was first of all to analyze, and if possible to provide a rapid solution to problems on the spot. The most rapid solution, since the results of the first 6 months revealed a somewhat unexpected picture for many: construction of the nuclear power plant began to lose speed. Between the approved schedules and the real situation there was a dangerous gap. This namely dictated the concerned appeal of the brigade foreman N. Derkach. The hall waited for the answer.

We will present, as verbatim as possible, a fragment of the discussion of the question. Fridberg Oleg Mikhaylovich, deputy head of "Soyuzatomenergostroy": Comrade Derkach, your debtors, are "Soyuzglavmatall" and "Soyuzglaves." The irregularity of their supply service and at the same time sluggishness of the USSR Gosplan are the main reasons for the today's misfortune. Derkach: as far as I know, the USSR Ministry of Power and Electrification which includes our department is also not particularly noted for efficiency.

Fridberg: What do you mean?

Derkach: I mean that the shipments supervised by the plants of the USSR Ministry of Power and Electrification, our direct supervisor are only provided by 70 percent of the plan.

Fridberg: I'll look into the situation as thoroughly as possible -- the metal designs will arrive! We will see that in the next months we and other departmental debtors will supply to the Balakov nuclear power plant the missing 4,000 tons of metal. 4,000 tons is not simply a number for us. We will mandatorily supply them.

Derkach: This is not merely a number for the ministry, but for our construction site it is! Is there a Kashirskiy plant in the system of the USSR Ministry of Power and Electrification? Is there?! It seems to us that this is a myth. Imagine, Comrade Fridberg: in a year we have not received a single gram of metal from this plant!

No it was not easy for the representative of the Ministry of Power and Electrification to answer the demanding questions. Eight hundred builders of the nuclear power plant had assembled in the hall and did not want "general" answers. They named specific guilty parties for the interruptions, insisted on an accurate answer when the debt for metal designs would be eliminated.

Fridberg: The maximum will be 2 months. Does this answer suit you, Comrade Derkach?

Derkach: Yes.

At the request of the readers, we publish the appeal to the leaders in the collectives of the Volga and Kashirskiy plants of the Ministry of Power and Electrification: why did they forget about the laws of the worker's relay race? When will they accurately fulfill their contract commitments?

Not living at someone else's expense

Two weeks before the holding of the "Day of the Open Letter," several hundred questionnaires were distributed among the builders of the AES with a number of questions concerning social-general and production problems. The obtained questionnaires made it possible for the working headquarters set up in the city party committee to compile a table of the most typical questions. There were about 140 unique questions and suggestions. Among them were practically none that are customarily called [economic] dependency issues. The thoughts of the people were primarily associated with matters of construction. This is not merely a phrase. The experience of the 4 previous all-union construction sites simply indicates to the Balakovo workers: successful construction also determines social, general and cultural welfare. The relationship is inseparable!

The plan includes earnings; the plan also includes a guarantee that forces will not be shifted to the main construction site from, say, the construction of a kindergarten, nursery, school, store or house. There is yet another feature in the portrait of the Balakovo worker: in the city there is almost no tree older than 25 years. Previously, there was no tradition to decorate the streets with greenery. Now Balakovo is an unusually green city. This is the unselfish work of the citizens. You must agree that this is a significant "antiparasitic" feature for its portrait. But nevertheless one can plant trees when the questions of production have been solved, in other words, there is time for this. The questionnaire was convincing: the typical builder of the AES is completely devoid of a parasitic attitude toward work, toward social problems of the city.

How Much Is a Minute Worth?

From the letter of Vladimir Akel'yev, brigade foreman of the installers: "We are searching for component losses only at the construction site. But they exist beyond its limits and on the approach to it. I have in mind transportation. See what's happening at the stations. Crowds and rattled nerves. But it's one thing when a man's mood is ruined when he's late to mother-in-law's pancakes, and another when this threatens arriving to work on time. The total losses of time are colossal. In the administration "Saratoygesstroy" there are